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**THE COMPLEX BUSINESS OF BUILDING AN
INDUSTRIAL BASE STRATEGY**

BY

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THE COMPLEX BUSINESS OF BUILDING AN INDUSTRIAL BASE STRATEGY

AN INDIVIDUAL STUDY PROJECT

by

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United States Army

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ABSTRACT

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Paper reviews and analyzes U.S. industrial base performance during the Twentieth Century (through the Gulf War) and examines major studies and indicators of industrial base decline. Four pressures which abet industrial decline, six specific obstacles which block industrial preparedness initiatives, and five variables which influence solutions to industrial base problems are discussed. Key areas covered include: recognition of the industrial base as linkage between economic and military power; unacceptability of "industrial policy" solutions to industrial base problems; assessment of economic competitors as a more serious threat than potential military adversaries. Paper makes recommendations for development of strategies, objectives, and programs/initiatives to enhance industrial preparedness. Major recommendations include: development of multiple strategies (industrial mobilization strategy becomes an element of national economic strategy and industrial surge strategy is isolated as a component of national military strategy); consolidation and refocusing of industrial base responsibility and authority (Departments of Commerce and Defense designated leads for mobilization and surge production, respectively); development of a technology agenda; legislative reforms; and emphasis on cost-effective and politically-feasible programs. Selected programs are discussed in detail.

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Mark E. Meranda

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THE COMPLEX BUSINESS OF BUILDING AN INDUSTRIAL BASE STRATEGY

CHAPTER I: INTRODUCTION

OVERVIEW

A nation's industrial base is a national treasure. The industrial base acquires and processes raw materials; it produces the consumable, durable, and capital goods for the nation's people; it creates and is part of the nation's infrastructure. A robust industrial base gives a nation a high standard of living, significant influence in world affairs, and the ability to mobilize and sustain military forces.

The industrial base of the United States was vitally important to the U.S. and its Allies during World War II. It was the Lend-Lease Program which helped keep Great Britain in the war and provisioned the USSR with trucks and a railroad infrastructure. Nikita Khrushchev conceded that Dodge 2 1/2 ton trucks made the advance from Moscow to Berlin possible (21:218). Neither the British nor Soviet economies could have sustained their war efforts against Germany without the United States.(21:215)

The vast potential of the U.S. industrial base also played a role in winning the Cold War. Its technological superiority and robustness served as a credible deterrent to Soviet aggression. The U.S. industrial base contributed to Soviet leaders focusing on a reduced international role and a smaller military structure to salvage a collapsing economy.

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The industrial base also serves as a barometer for the condition of a nation's economy. To the extent that a nation's economy is healthy and growing, one finds strength and vitality in the industrial base.(46:70) The reverse is also true. The industrial base is the linkage between the economic and military instruments of power. "Identifying changes in the linkage between economic and military power, is, therefore, key in setting new defense policy."(4:40) Our civilian and military leaders should recognize the linkage and the importance of preserving our industrial base.

CONSENSUS ABOUT INDUSTRIAL BASE IMPORTANCE

Our national leaders do agree on the importance of the industrial base to national security. Reports that our war reserve stockpiles are insufficient to sustain our forces beyond the first few weeks of a conflict reinforce that importance.(11:2) President Bush, in his March 1990 report on national security strategy, said:

A credible industrial mobilization capability contributes to deterrence and alliance solidarity by demonstrating to adversaries and friends alike that we are able to meet our commitments. While important progress has been made in recent years, more can be done to preserve our ability to produce the weapons and equipment we need. (40:27)

The Honorable Sam Nunn (D-Ga) included the industrial base as an essential element of a new military strategy. Speaking on the floor of the Senate in April 1990, he said ". . . innovative research to preserve our technological superiority; and preserving a viable defense industrial base. . ." should be part of our defense management and resource strategy.(28:S4450) In spite of apparent consensus between the executive and legislative branches, Republican and

Democratic countries, the industrial base is in trouble.

PURPOSE OF PAPER AND LIMITATIONS

The purpose of this paper is to recommend actions and programs which become essential elements of new strategies for achieving industrial base preparedness. Recommendations will be preceded by analysis of previous mobilizations and preparedness efforts, and by a discussion of issues and obstacles which block industrial base initiatives. This paper provides a foundation upon which viable industrial base strategies can be built; it does not offer quick cures for industrial base ills. It will provide orientation for those charged with recommending remedies and solutions.

UNDERSTANDING THE LANGUAGE

There are several terms, definitions, and concepts which are central to any discussion of the industrial base.

1) Defense industrial base: all the private and publicly held companies and government facilities which produce the weapons and other services purchased by the Department of Defense (DOD). Companies that sell directly to the government are prime contractors, or the first tier. Subcontractors, or second-tier contractors, supply materials, components, and services to the primes. A third tier supplies directly to the subcontractors. In 1985, there were between 25,000 and 30,000 prime contractors and approximately 50,000 second and third-tier firms.(45:1) Since the defense department procures across a broad spectrum of industry and very few companies deal exclusively with DOD, there is a large degree of commonality between the defense and commercial industrial bases. For planning purposes, DOD has a macro-interest in the entire production capability

of the United States. As a result, "defense industrial base" and "industrial base" are frequently used interchangeably throughout this paper.

2) Surge production: the increased or accelerated production of military equipment and material during crises or peacetime contingency operations. Absolute surge goals, such as 50% increase in production over 12 months (32:72), are being replaced by a graduated response concept. The Federal Emergency Management Agency (FEMA) developed a Graduated Mobilization Response (GMR) Plan which provides flexibility in deciding what and how much to surge. The distinguishing feature of surge production is the President or Secretary of Defense can order it using routine authorities.

3) Mobilization production: the increased or accelerated production and expansion of production capacity (enlarging or building new plants). Best examples are World War II and the Korean War mobilizations. Absolute goals, such as a 200% increase in production over 36 months (32:11), have also been dropped. Instead, the Office of the Secretary of Defense is encouraging the Joint Staff to develop mobilization "targets" that support GMR. (26:na) Ordering mobilization production requires special authorities obtained by declaring national emergency or war.

4) Industrial plant ownership: Most of the industrial base is privately or publicly owned. Federal facilities fall into two categories: government owned and government operated (GOGO); or government owned and contractor operated (GOCO). In addition, some private/publicly held plants are provisioned with government-owned machinery and equipment.

5) Industrial plant status: Active or "hot" plants or lines (production lines) are producing at or near to full capacity. Semi-active or "warm" plants are producing, but at a very reduced capacity. Inactive, "cold," or "laid-away" plants are not producing. Laid-away normally refers to government facilities which have been put into storage.

CHAPTER TWO: HISTORY OF INDUSTRIAL PERFORMANCE AND DECLINE

TWENTIETH CENTURY INDUSTRIAL MOBILIZATIONS

World War I

World War I provides the worst example of industrial base responsiveness. Europe was at war for three years before the U.S. became involved.(12:2-4) In spite of the ample warning and a sizable investment, we fought the war largely with equipment provided by the British and French.(46:5) "Although 23,405 tanks were ordered and \$175 million set aside to pay for them, none of these tanks were received for training, much less for use in Europe."(46:5) Poor industrial response to WW I is attributed to failure to identify requirements and to perform any meaningful industrial planning.(46:5,6) The response was more an indictment of policy decisions made than of the industrial capacity of the country during that period.

World War II

Industrial performance was better during World War II, but it still bore some similarities to the previous war. Despite significant support to allies beginning in 1939, US production did not peak until 1944. The most spectacular increase was aircraft production which rose from 2,141 total airplanes in 1940 to 96,318 in 1944.(21:219) Like WW I, mobilization production took several years to achieve and was accomplished through concurrent industrial and economic mobilization. A "government-managed economy" ensured that "crucial military requirements were met."(12:4-7) Tight government control not only satisfied military needs, but also resulted in the U.S. doubling the size of its economy during WW II.(12:5-14) Consideration of domestic politics convinced President

Roosevelt not to act on Army-Navy Munitions Board and War Resources Board recommendations in 1939 and 1940, which could have improved industrial response to our eventual involvement in the war.(12:6-6) A key lesson was that ". . . rapid industrial mobilization cannot be accomplished from a standing start without prior planning and without a baseline defense industry."(46:7)

Korean War

The Korean War was the catalyst which ultimately propelled the U.S. to the highwater mark of industrial preparedness by the late 1950s. "The U.S. responded to the invasion of South Korea with a massive preparedness program. . ."(12:2-1) The buildup was assisted by key legislation which had been passed after WW II. The Strategic and Critical Materials Stockpiling Act of 1946 provided for the procurement and maintenance of a strategic stockpile; The National Security Act of 1947 created the National Security Resources Board; the Armed Forces Procurement Act of 1947 exempted the military departments from competitive bidding procedures when facilities or suppliers needed to be retained in the industrial base for national security; and the National Industrial Reserve Act of 1948 authorized the defense department to retain machine tools, equipment, and industrial facilities for emergency production.(46:8,9) Between 1945 and 1950, over \$115 billion dollars were invested in new plant and equipment.(18:8) This massive defense outlay put tremendous inflationary pressure on the economy.(46:44)

The Defense Production Act of 1950 was passed in September 1950 to permit President Truman to deal with the economy. This legislation provided broad authority to establish wage, price, and import controls, to settle labor disputes, to establish priority and allocation systems, to impose consumer and real estate credit controls, to prevent hoarding, and to expand production capacity.(12:6-13) The act also authorized an office for executive branch oversight. The Office of Defense Mobilization (ODM) was established in December

1950 to coordinate and orchestrate mobilization programs and the many agencies involved with them.(46:16)

The industrial base mobilized during the Korean War, but planning and improvements continued after the armistice. Direct confrontation with the Soviet Union was still anticipated. Billions of dollars were invested in the industrial base during this period. In 1953 alone, approximately \$5.7 billion was appropriated for expansion of government facilities and another \$25 billion in tax amortization certificates were issued to encourage expansion of privately held plants.(46:37) In general:

Production facilities were created and military production goals were reached within the time set. Industry of all types was expanded, with particular emphasis on basic industry such as steel, aluminum, electricity, ore mining, and processing of critical minerals, and on the key foundation industry of machine tools. The United States attained a state of operational and mobilization readiness for both conventional and nuclear weapons . . .(46:43)

Following two consecutive wars and after considerable investment, the industrial base was prepared for war for the first and only period in our history.(46:43) This level of preparation could not last forever. By the time Vietnam erupted many of the programs had died, funding was reduced, government agencies and responsibilities had changed, and key legislation had either been repealed or amended.

Vietnam War

We required a different industrial response during Vietnam. We mobilized neither industry nor the economy, and required industry to surge production for specific items--primarily helicopters, some aircraft, ammunition, and bombs.(12:4-3) By the middle 1960s, our failure to maintain the high industrial preparedness levels of the 1950s was already manifesting itself.

The government had liquidated its conventional gravity bomb manufacturing equipment in the early 1960s. The U.S. Air Force rapidly depleted war reserves of 500 pound iron bombs and had to wait 18 months before receiving the first such bomb from new production. The government also did not have sufficient active government-owned ammunition factories to assure sufficient supplies of bullets and artillery shells.(12:5-4,5)

President Johnson, presumably sensitive to domestic political factors, elected to avoid national debate about our involvement in Southeast Asia.(12:6-5,6) Reserves were not ordered to active duty and no controls were placed on the economy.(46:44) This required us to fight the war on a peacetime footing. Funds were transferred from other accounts to minimize congressional debate.(12:6-6) This, in turn, prompted low bidder procurements by the defense department. The overall size and health of the U.S. economy permitted us to fight the Vietnam War without mobilizing industry, but some maintain that the ill-effects of the way we did "business-as-usual" (12:4-3) still adversely influence our preparedness today.(46:44)

Gulf War

Operation Desert Shield/Storm was our largest troop buildup since the Korean War and the most rapid ever. This placed demands on the industrial base. We surged production of some critical items and did it well. For example, the Army expedited production of Patriot II missiles from low rates to over 100 per month (as of mid-November 1990) and shipped them from the plant directly to the theater.(15:1) In the same period, 2 August 1990 to mid-November 1990, industry surged production of nearly 200 tanks, 4500 TOW II anti-tank missiles, and 1500 Hellfire missiles.(15:3) The Air Force surged over 13,000 items in this timeframe, both in-house and by industrial contracts.(15:3) The Navy surged contracts for spare parts, pumps, engines, ground support equipment, aircraft, and other items.(15:3)

There were problems surging production of nerve agent antidote, camouflage netting, desert pattern uniforms, and tray rations, items for which there is

little or no commercial application.(15:2,3,4). However, reasonable precautions were taken in many cases. Production of nerve agent antidote might have taken two years and cost \$40 million had not the Defense Logistics Agency maintained a warm production base.(15:4)

The assessment of the industrial response to Desert Shield was quite complimentary. As of mid-November, the logistics staff (J-4) of the Joint Chiefs of Staff were rating industrial planning and response to Desert Shield as "good."(16:na) Members of the Department of the Army logistics staff (DOSL06) also viewed industrial response as good. In fact, individual surge items were being handled by procedures delineated in a 31 October 1990 memorandum published by the Army Materiel Command, and the new and more comprehensive Graduated Mobilization Response procedures were untested (as of 19 November 1990).(34:na) The assessment of industrial response to Desert Shield was so generally favorable, it was easy to lose sight of the fact that no shots had been fired.

Success during Desert Storm should not be surprising. The \$2.7 trillion defense buildup between 1979 and 1988 had produced a high state of readiness; the world situation allowed us to draw down forces in CONUS and Europe.(26:na) Unrecognized by many at the time, President Bush declared a national emergency on 2 August 1990 when he imposed economic sanctions (EO 12722) on Iraq. Thus began the timely aggregation of two essential elements of successful warfare: coalition of national will and accumulation of special war power authorities.

Operation Desert Storm strained the industrial base, early successes notwithstanding. A heavy air campaign began on 16 January 1991. Just three weeks into the war, the Pentagon became concerned about U.S. ability to sustain the bombing. On 7 February 1991, former Army Chief of Staff, General John A. Wickham said that the United States lacked sufficient "surge capability" to replace Tomahawk cruise, TOW II, and Patriot missiles.(8:A8) Indeed, after a six-week air war and a 100-hour ground war, stocks of precision-guided munitions were very

low. Prospect for rapid replacement were dim. It will take many months before the analysis of industrial response to Desert Shield/Storm is complete. Preliminary results, however, confirm the dire findings of numerous reports issued over the last 10 years.

Summary of Industrial Responses to War

We have asked industry to respond to wars in different ways. World Wars I and II were declared wars and we mobilized industry to fight them. Industrial mobilization during WW II was more effective due to better planning, more reaction time, and full mobilization of the economy. The Korean War was fought under declaration of national emergency, but industrial and economic mobilization fully supported the war effort. In Vietnam, we fought a major war with implied consent and the Gulf of Tonkin Resolution, but never mobilized industry or the economy. The President wanted ". . .to minimize the impact of the war on the lives and standard of living of the American people . . ."(12:4-2) During Vietnam industry surged to meet selected military shortfalls. The War in the Gulf was fought with declaration of national emergency and a Congressional vote of support that mobilized national and political will. Industry was required to surge, but in-place authorities to mobilize industry and the economy were never exercised due to the short duration of the land campaign. Review of U.S. mobilizations shows that the highest state of industrial preparedness began during the Korean War and culminated in the late 1950s.

ANALYSIS OF 1950s' INDUSTRIAL BASE PREPAREDNESS

The United States achieved sufficient industrial preparedness for the first and only time during the 1950s. Understanding why and how is fundamental to analyzing potential solutions to current problems. Four elements seem essential to this prior success.

Imminent Threat

The first element was that the Soviet threat was portrayed and perceived as real and imminent. NSC-68 painted a frightening picture of an atomic-armed Soviet Union bent on world domination. The document calculated that developing Soviet atomic capability would surpass that of the United States to the extent that an initial attack could be expected by 1954.(36:82) There were some skeptics, among them the Secretary of Defense.(36:51) However, scarcely two months after NSC-68 was published the North Koreans poured across the 38th Parallel. That seemed to confirm the validity of NSC-68 and this nation embarked in earnest to deter World War III.

In summary, we must, by means of a rapid and sustained build-up of the political, economic, and military strength of the free world, and by means of an affirmative program intended to wrest the initiative from the Soviet Union, confront it with convincing evidence of the determination and ability of the free world to frustrate the Kremlin design of a world dominated by its will.(36:108)

President Truman declared a national emergency on 16 December 1950.(46:16) The President released quarterly reports on the status of mobilization preparation to galvanize congressional and public support and to keep America involved in the costly enterprise of building preparedness.

Economic Mobilization

Economic mobilization was the second key to success. President Truman drew upon our World War II experience. Economic controls were required if defense needs were to be satisfied without inflation.(46:15) The economy would have to expand rapidly or the defense buildup would become a serious burden to every American.(46:15) The Defense Production Act of 1950 gave the President the tools he needed to leverage the economy to support both the Korean War effort and the massive industrial expansion program.

Centralized Authority

Centralizing responsibility for mobilization was the third key element.

Mobilization preparedness oversight for national-level planning, programming, and execution was vested in a single agency, the Office of Defense Mobilization (ODM). The director was responsible for providing policy guidance and control, and for coordinating and settling interagency differences.(46:18) Along with the consolidation of responsibility came commensurate authority. The Director of ODM had cabinet-level rank and was on the National Security Council.(46:16) The director was also responsible for developing a strategy that would achieve the goals delineated in NSC-68.

Viable Strategy Objectives

The fourth element was viable and complementary economic and military objectives. The director of ODM, Charles E. Wilson, articulated four goals in his first quarterly report (1 April 1951): to produce military goods for our forces in Korea, our allies, and for one full year of war reserve stock; to provide additional production capacity beyond that which is required for current needs; to develop basic resources, expand production capacity, and improve the U.S. standard of living; and to maintain a healthy civilian economy.(46:17) These presented a serious challenge, but ODM completed the strategy by developing the programs and obtaining the resource support for them. Also of importance was the secondary effect that this national security strategy had.

The defense department developed a complementary national military strategy for industrial mobilization following the Korean War.(41:11) Recognized as the "D-to-P Concept", it was proposed by the Vance Committee Report in 1953.(46:34) Its premise was simple. Have stockpiled enough equipment and material on D-day (start of hostilities) to last until industrial production can satisfy wartime requirements, P-day. The greater your production capacity, the smaller your stockpile requirements. Investment in capacity was generally viewed as more economical than investment in inventory.(46:37) Programs were resourced to meet this objective during the 1950s. The objective portion of the strategy was

retained (without adequate program and resource support) until July 1976.(45:3)

Success in Summary

The highwater mark of industrial base preparedness was achieved after two consecutive wars in which industrial response was, on-balance, lackluster. We learned from our mistakes. The Truman Administration understood the linkage between the industrial base and national security. The President parleyed a real threat with Congress and the American people, obtained adequate funding for achievable objectives, mobilized the economy to support the effort, and consolidated responsibility and authority for program execution.

REPORTS OF INDUSTRIAL BASE DECAY

Significant evidence of industrial base deterioration has been available for the last decade. The Ichord Report, prepared in December 1980 by the Industrial Base Panel of the House Armed Services Committee, issued a clear and unambiguous warning. In a letter transmitting the report, Chairman Ichord said:

The panel finds that there has been a serious decline in the nation's defense industrial capability that places our national security in jeopardy. An alarming erosion of crucial industrial elements, coupled with a mushrooming dependence on foreign sources for critical materials, is endangering our defense posture at its very foundation.(18:iii)

Other findings in the report included: strong condemnation of the defense department for neither a plan nor program to enhance industrial base preparedness; shortages of critical materials combined with a dependence on foreign sources; policies and procurement procedures by DOD which do not promote the best interests of the United States; tax laws and profit policies which discourage capital investment in plants and new technology; and diffusion of responsibility for the industrial base which contributed to a lack of long-range planning.(18:1) The Ichord Report sounded a warning which was overdue; it also

held the defense department responsible.

By laying responsibility with DOD, the Ichord Panel failed to recognize the industrial base as the linkage between economic and military power. There was ample historical precedence establishing major economic legislation as a key element to attaining industrial base preparedness. That the defense department could or should broadly influence the United States economy for the sake of military preparedness would seem to resurrect the specter of the military-industrial complex of which President Eisenhower spoke in his 1961 Farewell Address. Mr. Roderick Vawter was more objective in discussing this significant event:

For reasons that appear to relate to jurisdictional authority within the House of Representatives, the Ichord panel applied a defense label to many problems that are much broader in their implication.(46:70)

The Secretary of Defense was charged with the responsibility for "administering preparedness planning with industry" by Executive Order 11490 in October 1969.(35:1) However, there is a quantum leap in degree between responsibility for planning and responsibility for "the preparedness" (which also implies execution of planning). In all fairness, somebody had to be responsible.

The General Accounting Office was the next to be heard. In a May 1981 Report to Congress, the Comptroller General reinforced the notion that DOD was responsible for defense industry preparedness and confirmed the absence of viable strategies and programs to improve the industrial base. An inset on the front cover of the report said:

The Department of Defense's Industrial Preparedness Planning Program is to make sure U.S. industry can respond to wartime needs for military items. However, despite repeated study, this program has remained in a state of complete disarray for the past several years. The current program has limited funds and a low priority, and it is ineffective.(35:cover)

The criticisms by the Ichord Panel and GAO led to a significant increase in the quantity of planning. Unfortunately, plans are only written and they do not

lead to any real improvement in physical capability.

The Packard Commission, President Reagan's Blue Ribbon Commission on Defense Management, commented on the industrial base in its 1986 report.

Production surge capability is essential for improved readiness and sustainability of United States forces. Up to now, planning for surge and industrial mobilization has been an ad hoc affair, largely the result of individual initiatives rather than done on a regular basis or in response to a shift in threat, U.S. national strategy, or world economic conditions. Industrial preparedness typically loses out in the competition for DOD funds. The problem has been studied, reviewed, and analyzed by many--with documented findings. There is now a need for selective and prudent investments to obtain real improvement in industrial base responsiveness.(6:71)

By 1986, the issues and ills confronting the industrial base were multiplying at a faster rate than solutions could be conceived. The industrial competitiveness of the United States was waning. A July 1988 report from the Under Secretary of Defense (Acquisition) cited studies on wages, trade balances, growth, and human resources, each of which suggested that the U.S. was losing its competitive status. It went on to say that the weaknesses were "deep-seated, structural, and not quickly remedied" and that they "forecast dire consequences if not reversed." (43:5) Two small sentences in the middle of that report also provided keys to possible solutions.

Although the Department is not responsible for economic policy, the Department of Defense must do its part to foster and cooperate in such an effort. Second, the Department of Defense must develop a strategy to improve the capabilities of the defense industrial base.(43:11)

This was the first concrete step to finding a solution because it viewed industrial base linkage in the proper context. Industrial base preparedness cannot be achieved without a healthy economy, and DOD is ill-equipped to deal in economic initiatives. Industrial base preparedness cannot be achieved without viable strategies, defined as resourced (funded) programs calculated to attain specified goals and objectives. Several months after the DOD report was published, Executive Order (EO) 12656 was issued (November 1988). This document

assigned the lead for industrial base preparedness to the Department of Commerce (DOC). (39:47496) DOD retained responsibility for developing "preparedness measures," in "cooperation" with DOC. (39:47498) Unfortunately, industrial base status is not as bad in 1988 as it will become. There were new and more alarming concerns.

United States industry is losing or has lost its technological edge in many areas where it formerly held leadership positions, such as numeric control machine tools, microelectronics, optics, and bearings. (10:3) DOD has identified 20 technologies in which U.S. superiority is vital to national security. An October 1990 Report to Congress by the DOD Office of Industrial Base Assessment reviewed our technology position vis-a-vis that of Japan. The report cited a DOC analysis of 12 emerging technologies which are expected to have a major economic impact in the next decade (see Figure 1). In the area of research and development (R&D), the U.S. was ahead of Japan and holding that lead in only four of the 12 areas. In product introduction (marketing technology), the U.S. was ahead and holding only in the area of artificial intelligence.

LOSING TECHNOLOGY LEAD

Relative Standing in Emerging Technologies
(U.S. versus Japan)

TECHNOLOGY	R&D	PRODUCT INTRODUCTION
Advanced Materials	Even/Losing	Behind/Losing
Advanced Semiconductor Devices	Even/Holding	Behind/Losing
Artificial Intelligence	Ahead/Holding	Ahead/Holding
Biotechnology	Ahead/Losing	Ahead/Losing
Digital Imaging Technology	Even/Losing	Behind/Losing
Flexible Computer-Integrated Manufacturing	Ahead/Holding	Even/Holding
High-Density Data Storage	Even/Holding	Behind/Losing
High-Performance Computing	Ahead/Holding	Ahead/Losing
Medical Devices and Diagnostics	Ahead/Holding	Ahead/Losing
Optoelectronics	Even/Holding	Behind/Losing
Sensor Technology	Ahead/Losing	Even/Holding
Superconductors	Even/Losing	Even/Losing

Source: DoC, *Emerging Technologies*, Spring 1990

FIGURE 1 (10:15)

There is concern about the extent to which the United States is dependent on foreign suppliers and manufacturers for both products and the manufacturing processes. The problem may be understated. An earlier 1989 GAO report concluded:

Although evidence of DOD's foreign dependence for critical items in certain weapons systems exists, it is impossible to measure the overall impact or extent of such dependence because DOD has no reliable system to identify foreign dependencies in parts, components, and technologies essential to defense production.(44:3)

Numerous other studies, reports, and investigations can be offered as evidence of industrial base deterioration. Twenty-six major studies have been completed since 1986 and more are in progress.(47:na) Conceding some tentative success in the Desert Shield operation, the inescapable conclusion is that the industrial base is eroding at a precipitous rate and industrial base preparedness is unacceptably low. Private organizations, such as the Association of the United States Army, are adopting resolutions calling for immediate and effective remedial actions to address industrial base problems.(2:45) We have seen preparedness declining for at least the last decade, but the decline started over 35 years ago.

CHAPTER THREE: DESCRIBING THE CHALLENGE

PRESSURES WHICH ABET INDUSTRIAL BASE DECLINE

There are four major pressures which counteract initiatives to reverse declining industrial preparedness. The common characteristic of these pressures is that the federal government has limited ability to control or influence them.

Low Priority

It is the first pressure, insufficient priority due to lack of urgency, which precipitated the initial decline in industrial preparedness. Two events contributed to deemphasizing the importance of industrial preparedness before we ever achieved the highwater mark of our readiness. The first was the success of deterrence in preventing war. The massive industrial buildup of the early 1950s and the effectiveness of the containment policy thereafter spawned complacency.

The "short war" scenario was the second precipitant to declining interest in industrial preparedness. The origins of this mentality are attributed to the U.S. Air Force. In 1955 the Air Force espoused the Force-in-Being concept which concluded that " . . . the next war would be a total nuclear war fought with the weapons on hand at the start." (46:49) As a result, the Air Force conducted no mobilization planning with industry between 1958 and 1967. (46:49) While this was contrary to DOD policy and the planning activities of the other services, it was a logical extension of nuclear superiority and mutually assured destruction strategies. Industrial preparedness would be a non-factor in a nuclear conflict. (46:41)

The short-war mentality further fueled complacency and the consequences for the industrial base were predictable. Priority and funding for industrial preparedness were lost. Meaningful planning with industry discontinued and plants built during WW II and the Korean War were not maintained. The impact of this

inattention was partially felt during Vietnam, but the aging process has continued to this day. Funds to modernize government plant and incentives for industry to modernize commercial plant have not been provided in any meaningful amount.

Procurement Procedures and Budget Process

Interest in retaining current federal procurement and budget practices is the second pressure. DOD's use of competitive bidding is the central issue. "Low bidder, winner-take-all" procurement procedures were initiated during the Vietnam War to keep costs down. This procedure is alleged to have undone years of planning with industry by invalidating all planning agreements which had been made.(46:52) Planned producers were awarded contracts only if they were the low bidder. Frequently they were not and government equipment in their plants had to be removed and shipped to the contract winner.(46:52) This policy was the opposite of using current procurements to maintain industrial base producers as was done by ODM in the 1950s.(46:52) The low bidder policy is still in effect. It can drive unsuccessful bidders out of the market, which serves to shrink the industrial base. Successful low bidders do not necessarily add to the base. They may take the profits and convert or abandon the plant infrastructure upon completion of the contract.(41:14,15) Despite these impacts, competitive bidding has broad executive and legislative branch support because of the high cost of modern weapons systems.

The national budget process is closely related to procurement practices. One-year defense appropriations are a hinderance in the DOD-defense industry relationship. Even though Congress can approve multiyear contracts, the rule is that one-year appropriations beget one-year procurements. This has had the greatest impact in the area of industrial plant modernization. Contractors view the long-term capital improvement of industrial plant for short-lived defense contracts as bad business. At the very least, the combination of competitive

bidding and one-year defense appropriations serves as a disincentive for industry to modernize. Plant modernization by defense contractors is high risk and usually unprofitable, so modernization is not happening.

Failing Competitiveness and Economic Interdependence

Failing industrial competitiveness is the third pressure. This is a simple case of the free market at work. Businesses which do not make a profit fail. This is happening across a broad spectrum of U.S. industry because foreign producers can undersell them. It is occurring due to a complicated interaction of economic factors which are best described as a trend toward global economic interdependence. Regardless of cause, the bottom line is that loss of competitive industry means loss of industry. This further shrinks the industrial base. It also causes foreign dependence for the things you do not produce domestically. This pressure has been increasing since the 1970s.

Rising Costs and Levels of Technology

The fourth pressure is rising costs and levels of technology. Cost and technology are closely related. Like declining competitiveness, this is a more recent phenomenon. The spiraling cost of new weapons systems tends to limit the number of potential contractors. There are very few firms which can competitively bid on a \$.6 billion B-2 bomber, for example. Weapon systems costs' have escalated because of the rapid evolution of technology. Cost increases far exceed those attributable to inflation alone. The cost of modern aircraft is between 50 and 120 times higher than World War II era aircraft after adjustments are made for inflation.(4:45) The cost of applying new technology is the reason. Cost and technology have had the combined effect of greatly reducing the number of arms' producers.

Some feel the Reagan expansion masked the real condition of the base. It poured money into it, but kept only a few, modernized competitors in the arms production business.(23:19) Indeed, the technology explosion and the massive

modernization programs under the Reagan Administration may have out-paced industry's ability to establish production infrastructure. Prospects are that costs and technology levels will continue to rise at precipitous rates. The industrial base will feel the relentless impact of this pressure.

OBSTACLES TO INDUSTRIAL BASE PREPAREDNESS

The level of industrial base preparedness achieved following the Korean War was a monumental accomplishment. Having the preeminent world economy made that effort possible. Today, our weakened economy does not support extravagant remedies. There are six major obstacles to achieving industrial base preparedness and resources alone cannot overcome them. These obstacles were built by the abetting pressures which fuel decline.

Diminishing Threat

The threat, that factor best able to reverse complacency, is shrinking. It has diminished with the fall of the Berlin Wall and the disestablishment of the Warsaw Pact. National determination to do something about the industrial base is lacking. The President and the Congress lack a mandate to make expensive improvements. Major industrial base initiatives will be expensive and must, by necessity, include economic initiatives as well. Industrial base expenditures advocated for the sole purpose of improving military preparedness will likely go unfunded in this time of large deficits and tight budgets. Not surprising, DOD has attempted to justify many improvements for that very reason. Funding new or expensive military programs during periods of declining military threat defies conventional political wisdom. Low threat and high complacency, those related factors which have spelled low priority and miniscule funding for the industrial base, will continue to be prominent obstacles in the 1990s.

Diffused Responsibility

Responsibility for fixing the industrial base problem is more divided than ever. This is, in part, due to the complex nature of the issues involved. During the Truman years, the Office of Defense Mobilization had the responsibility and authority to deal directly with all aspects of mobilization, including the industrial base. During the Eisenhower, Kennedy, Johnson, Nixon, and Carter administrations, the functions of ODM were expanded then curtailed, combined, then ultimately fragmented and diffused. Agency responsibility for the industrial base transitioned from ODM to the Office of Civil and Defense Mobilization, to the Office of Emergency Planning, to the Defense Civil Preparedness Agency, to the Federal Preparedness Agency, and, finally, to the Federal Emergency Management Agency.(46:79,80) Government is not well organized to address the wide array of issues impacting on the industrial base. Examples of diffused responsibility and authority abound.

National Security Council

The NSC is the President's advisory committee for national security policy and strategy. An interagency group, the Policy Coordinating Committee on Emergency Preparedness/Mobilization Planning (PCC-EP/MP), makes recommendations to the President on national policy dealing with the mobilization of the industrial base. It is within the NSC that the industrial base linkage between economic and military power must be clearly understood. It is here that national security strategy is conceived. The NSC must broker the industrial base linkage between DOD's military strategy and the domestic and economic policy formulated by the Domestic Cabinet Councils.(33:8)

Federal Emergency Management Agency

FEMA is the direct descendent of ODM. It is responsible for preparing and coordinating plans that permit the civilian sector and federal government to respond to national emergencies.(9:37) FEMA does not have the total

responsibility ODM had, nor does it have directive authority over federal activities which share responsibility for portions of the industrial base problem. FEMA's industrial base focus is on mobilization. It has no funded programs to support industrial base preparedness. FEMA has developed a "Graduated Mobilization Response Planning Guide" pursuant to Executive Order (EO) 12656 of November 1988 (39:47493), but FEMA's planning remains emergency/mobilization oriented. Many contingencies which require industrial surge do not reach the threshold of emergency which prompts significant FEMA involvement.

Department of Commerce

According to EO 12656, DOC is the federal agency with "lead responsibility" (in cooperation with the Secretary of Defense) for developing industrial production preparedness measures and policy alternatives to improve international competitiveness of defense industries.(39:47496) However, DOC lacks authority over science and technology. Responsibility for research and development (R&D), the bedrock of technology and a key element of the competitiveness equation, is spread among 12 federal agencies.(20:15) DOC also lacks jurisdiction over foreign trade issues which directly affect industrial competitiveness. Commerce does have specific responsibility for the Defense Priorities and Allocation System (Title I of the DPA of 1950) and the Defense Materials System.(1:9,10) While Commerce has prepared a number of production base analyses, it has proffered few initiatives. DOD has taken the lead for funded programs to improve industrial preparedness. Commerce has no specific focus on the industrial base, but it must be a major player in formulating the kinds of economic strategies that will make the industrial base capable of responding to mobilization production requirements.

Department of Defense

DOD and subordinate agencies have a long-standing interest in the industrial base. DOD is funded for operating GOGO and GOCO industrial plants

which manufacture military end-items (the General Services Administration is responsible for plants which provide production materials).(46:37) DOD also coordinates with and conducts planning for surge and mobilization production with segments of the commercial industrial base. However, surge and mobilization planning is not taken seriously by industry based on a number of surveys (9:61) and interviews (1:xi). This is because no money is provided for industry planning, analysis is difficult (especially at the lower tiers), and due to industry recognition that not much results from such planning.(26:na) It may also reflect on the way planned producers were treated during the Vietnam War.

Other DOD programs aim for private plant modernization. The Industrial Modernization Incentive Program (IMIP) has had some limited success, but plant improvements were product specific and difficult to apply to follow-on processes.(23:10,11) The Manufacturing Technology Program (MANTECH) seeks to encourage new technology on the plant floor. Plant managers have been reluctant to participate in MANTECH because of the large capital investments required (even with DOD sharing the cost) and little short-term profitability.(23:11)

In recent years, DOD expanded its industrial focus to include market competitiveness and the commercial application and marketing of technology. The DOD Critical Technologies Plan identifies 20 technologies which are essential to U.S. national security.(10:2) In 1987 DOD joined a consortium of 14 U.S. semiconductor companies, called Sematech, in an effort to develop advanced manufacturing technologies for computer chips (10:11) for the purpose of recapturing leadership of the commercial market back from Japan.

DOD's programs have focused on improving surge capability. DOD continues to plan for industrial mobilization preparedness, but it does not have the mandate or the authority for the kinds of economic initiatives that are required. Furthermore, DOD does not have wide contacts or access to industry or directive authority over non-DOD agencies which do. The Secretary of Defense is

consolidating industrial base responsibilities under the Deputy Assistant Secretary of Defense for Production Resources (10:3), but the operations of the Defense Science Board (DSB), Defense Advanced Research Projects Agency (DARPA), and the Strategic Defense Initiative Office (SDIO) continue to run semi-autonomously.

Congress

Congress must appropriate the funds for industrial base programs. Congress must also exercise leadership in coalescing the national will and in organizing along functional lines to provide the best possible oversight of funded programs. Congress and the executive branch suffer from the same diffusion of responsibility for the industrial base. Where there are 12 executive agencies working R&D policy and programs, there are at least 13 different congressional committees responsible for R&D appropriations.(20:15) Congress demonstrates leadership by consistency in setting priorities. The current committee system promotes neither consensus nor consistency for R&D.(20:15) The same argument can be made for a whole spectrum of issues impacting on the industrial base.

Requirements Determination

Failure to clearly identify what industry must provide for surge and mobilization has been a traditional obstacle. In the 1950s we wanted to have more of everything and we were economically capable of implementing programs to achieve that. Today, with technology exploding and diverse potential foes and crisis situations, the task of identifying what we will need is more difficult. In 1981, the GAO noted that item selection and requirements determination were " . . . done differently by each service and are often not done well."(35:i) A 1987 Defense Logistics Agency report found that "there was minimal overlap between the War Reserve requirements submitted by the services and the items which DLA manages which support the CINC CIL [Commanders'-in-Chief Critical Items List]."(30:ix) In fact, out of nearly 329,000 items on a combined War Reserve and

CINC CIL list, there was correlation on only 28,531, less than 10%. (30:4)

Estimation and coordination of industrial base requirements continues to be one of the most difficult and important tasks; "given the broad range of scenarios that might require U.S. involvement, there is a danger that requirements will be estimated for the wrong war . . ." (12:3-1) Identifying and articulating requirements remain key to development of any meaningful strategy to improve the surge and mobilization capacity of the industrial base.

Industrial Policy

Another impediment to improving the industrial base results from opposing economic ideologies. Industrial base planners at DOD and FEMA are unanimous in their reluctance to propose any industrial base solutions which may be construed as or imply "industrial policy." Free market administrations have controlled the executive processes for the last 10 years. Programs which subsidize and prop-up failing and inefficient industry have been viewed skeptically, if not rejected out of hand. Subsidies remove free market incentives to make better and more economical products. Conventional wisdom is that government support cannot last indefinitely, and when it is withdrawn the business will eventually fold anyway. Better to let the free market establish the most reliable, efficient, and economical source, even if it is overseas. Exceptions can be made, such as government support of Sematech, but only if a compelling national security argument can be made. The crumbling command economies of Russia and Eastern Europe certainly argue for less, not more, government involvement in the economy and the industrial base. Those who develop strategies must recognize the political baggage that economic and industrial policies carry with them.

Lack of Strategies

Another major obstacle to improving the industrial base is the lack of coherent, viable strategies. DOD and FEMA industrial base planners could articulate no strategy and agreed that comprehensive programs with adequate

resources do not exist. When dealing with the industrial base, objectives are many, programs are few, and resource support does not exist to any meaningful degree. There are numerous examples. A 1988 DOD report on "Bolstering Defense Industrial Competitiveness" purported to lay out a strategy on this aspect of the industrial base problem. It listed six "strategic thrusts" as part of the action plan:

(1) forging the right relationships with industry; (2) improving the acquisition system; (3) establishing defense industrial strategic plans that support our military strategic plans; (4) developing manufacturing capabilities concurrent with the development of weapons systems; (5) laying the foundation now for the technical skill base required for tomorrow's defense needs; and (6) ensuring that industrial base issues important to our defense benefit from the full spectrum of potential policy remedies, when appropriate. (43:vii)

Few would argue the appropriateness of the objectives of this "strategy," but there are no supporting programs in the document. Resources are also unaddressed, except for the implicit dedication of manpower to the planning and coordination functions.

A more recent example can be drawn from the Army Materiel Command's 19 November 1990 industrial base conference. The following "Industrial Preparedness Strategy" was briefed at that conference:

Industrial preparedness activities will be performed to influence weapons systems design for mobilization production, to insure [ensure] an efficient peacetime production, and to provide a capability to sustain wartime operations when given a 12-18 month warning time.(31:na)

Again, we see laudible objectives cloaked as strategy, without requisite program or resource support. These are typical of many DOD solutions proposed for the industrial base. Most are oriented on military objectives. Economic strategies and objectives are difficult to find.

Linkage Recognition

This leads to the final roadblock to meaningful solutions; that is, the apparent failure to recognize that the industrial base is the linkage between

military power and economic power. The industrial base is deteriorating in part due to counterproductive defense policies and procurement procedures, but in large part it is a by-product of economic deterioration. DOD initiatives are only a bandaid on a more serious problem. DOD programs may influence selected industries or industrial sectors, but long-term ability to go to mobilization production levels across the entire industrial base will require a healthy US economy. The ability of the industrial base to support DOD is not the most pressing national security interest, loss of US economic superiority, and all which that implies, is.

VARIABLES THAT COMPLICATE SOLUTIONS

Force Structure and Modernization

Force structure and modernization programs drive the size and product technology of the defense industrial base. As force structure declines, the industrial base supporting a smaller force structure also declines. Weapons systems modernization forces industry to produce better technologies. The dilemma is that most new technologies drive up cost, and may further shrink the number of competing manufacturers. Capital investments for plant improvement are considered risky if accomplished for the sole purpose of fulfilling defense contracts.

Threat Warning Time

Assessment of the threat also represents a double-edged sword. A large threat may increase force structure, but the response time to react to that threat is equally important. The NSC has captured the essence of this subjective observation in the following graph.

WARNING TIME PLOT

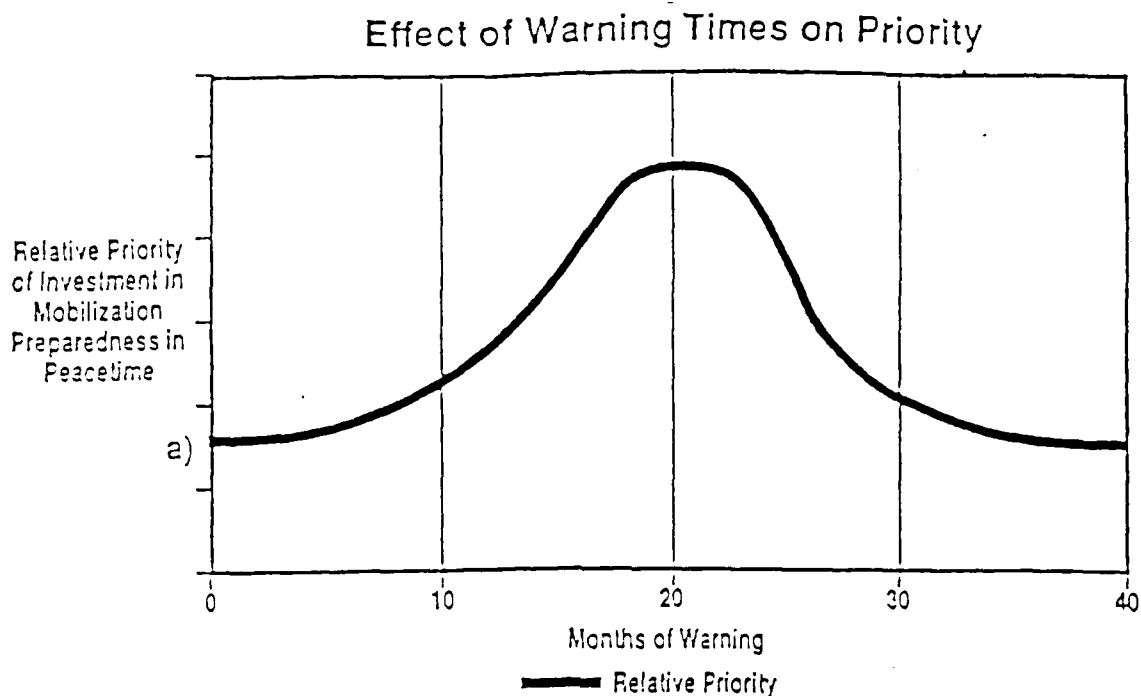


FIGURE 2 (27:6)

The curve suggests that investment in mobilization preparedness receives the highest priority if there are between 10 and 30 months to react to a potential threat. In short-warning scenarios, mobilization investment loses priority because the investment does not provide results in sufficient time. If the warning period is longer than 30 months, then there is insufficient imminent danger to justify a high priority. Note that the plot considers traditional military threats only.

Size and Nature of Threat

Magnitude of the threat is also important. The Cold War Soviet threat to Western Europe, 4 Combined Arms Armies in 14 days, was simply too great a challenge.(26:na) NATO developed the flexible response as a counter, a theater

version of the Forces-in-Being concept. In this case, a large threat which provided little reaction time would be defeated by a limited nuclear option. The flexible response spawned the come-as-you-are-war mentality and the industrial base sustainment of conventional forces became a minor issue, again.

Evolving Military Strategy

National military strategy is another important variable in the industrial base equation. New military strategy has been evolving since the end of the Cold War. Industrial base preparedness must complement it. Several features of the emerging, post-CFE strategy and environment seem clear. They will require a more responsive and flexible industrial base than we have ever had before.

1) A regional orientation is replacing the East-West orientation at the conventional warfare level.

2) While there is more warning time against traditional adversaries, there are a number of short-warning scenarios against potential regional foes.

3) The armed forces will be smaller by about 25% across all services. Desert Storm delayed the build-down, but demobilization will begin in earnest once the redeployment begins.

4) A smaller force will rely on a forward presence in lieu of forward deployments. This means that strategic mobility and the capability to quickly reconstitute a larger force structure become imperatives.

5) There is increasing likelihood that potential regional foes will have sophisticated weapon systems.

U.S. Economy

The most important variable is the U.S. economy and where it is heading. Will it be capable of meeting the future needs of our nation, of providing the industrial base that links economic to military power? In broad terms, there are really two issues. The first is the willingness to make policy and to apply resources to the industrial base. The second is whether the industrial base is

capable of responding if policies are in place and the resources applied.

Both issues require that we come to grips with the economic threat. Our tremendous national debt, the staggering amount of interest we pay on that debt each year, foreign trade deficits, the high rate of bank failures and personal and corporate bankruptcies, increasing foreign ownership of U.S. business, and dozens of other indicators provide an indication of the threat. The indicator which bodes worst for the industrial is the loss of manufacturing technology to foreign competition. This occurred in the microchip industry and the national security implications are tremendous.

Decline of the economy has had a profound impact on the defense industry. The number of contractors who can produce capital goods and high-technology equipment has shrunk drastically. There are only 17 primary shipyards active in the United States today; the last commercial vessel produced in this country was in 1987.(17:2) By contrast, during the Korea War over 100 major shipyards supported the naval rearmament program.(46:23) In the last 10 years, the number of major aircraft producers has gone from 12 to 6.(17:20) The problem extends to the sub-tiers as well. Only two U.S. companies produce large gas turbine engines for aircraft, General Electric and Pratt & Whitney.(10:24) Only 5 more companies produce the smaller turbines which go into cruise missiles, armored vehicles, and ships.(10:24) At the same time the U.S. was losing world leadership in numerical control machine tools to Japan and Germany, the number of major U.S. producers declined to two.(10:55-57)

This phenomenon is not confined to the commercial portion of the base either. This nation only has one operating tank production facility (Warren, Michigan). That plant could be laid-away as early as 1993, once the A1 upgrade program to the Abrams M1 main battle tank is completed.

Thinning of the industrial base, dependence on single domestic sources, is a major concern. Some critics argue that reliance on single domestic sources is

more risky than depending on overseas producers.(25:49) The implications are that foreign policy, economic policy, and defense policy must be integrated and reviewed in a comprehensive manner.

The basic message is clear: national security can no longer be viewed in exclusively military terms; economic security and industrial competitiveness are also vital considerations.(20:133)

CHAPTER FOUR: BUILDING INDUSTRIAL BASE STRATEGIES

CLARIFYING STRATEGIES, OBJECTIVES, RESPONSIBILITIES

Need for Multiple Strategies

There is no single strategy that will solve the problems of the industrial base. Multiple strategies will be required. Preparing the industrial base to respond to global war, the worst case mobilization production requirement, must be undertaken as a component of national economic strategy. This paper assumes that mobilization preparedness can be achieved only with a healthy U.S. economy. On the other hand, preparing the defense industrial base to surge for peacetime contingencies should be an element of national military strategy. This division of industrial base focus is important because it emphasizes both the economic and military threats to the national security of the United States. At the same time, it suggests a shared responsibility for strategy between departments best able to develop and implement those strategies.

Coalesce Support Using Economic Threat

The imminence of the economic threat should be used to rally popular support for programs that will bolster a declining industrial base. Clearly, the objective of an economic strategy should be to enhance the economic superiority which we still maintain. Programs supporting attainment of this objective would include an industrial base which is competitive in the world market, an industrial base which satisfies the peacetime domestic needs of the United States, and an industrial base which has the mobilization potential to rapidly satisfy the increasing needs of our nation during a major war.(23:1)

Quantity or Quality?

Clarification of industrial base objectives must occur for each strategy. The recurring issue of production capacity (ability to produce in quantity) or production quality (technologically superior products) is at the heart of objective formulation. During WW II and the industrial base buildup of the 1950s, we strove for both quality and quantity. Our declining world economic position forced the U.S. to alter that approach during the height of the Cold War. We made a conscious decision to focus on quality to off-set Soviet numerical superiority. The Strategic Defense Initiative, Defense Critical Technologies Plan, and other initiatives predispose us to continuing a quality orientation. An essential element of our strategy objective must be a technologically superior production base. Technological superiority applies to both the manufacturing processes and the products that result. Technological superiority becomes an objective of both the national economic and national military strategies.

Mobilization Capacity: Seek Superiority

The quantity objective cannot be ignored. Economic superiority dictates that the United States out-produce potential economic competitors. Attainment of this objective is measured in the U.S. share of the domestic and world market place, as well as GNP. Out-producing competitors does not mean U.S. monopoly or even a majority share of the market. In the simplest terms, if the U.S. holds the largest fraction of the market share across a broad spectrum of products, it has the demonstrated capability to out-produce competitors. This implies that the defense industrial base could also out-produce potential military adversaries at mobilization production levels. That should be the national objective because it goes right to the heart of the United State's survival interest. This is an economic objective. Mobilization capability is viewed as attainable only with a healthy US economy. Attainment of mobilization capacity will be the by-product of larger and more important economic policy initiatives.

Military Strategy Concentrates on Surge

We must decide whether our short-term capability to build military items should be superior to, equal to, or sufficient in comparison to potential adversaries. This goal must support our national military strategy in terms of the force structure which the base supports. Attaining surge capability is the more pressing requirement for the armed services, given the higher likelihood of regional conflict scenarios and our recent history of fighting short wars. The national military strategy objectives should target the surge capability of the defense industrial base.

Surge Sufficiency vice Mobilization Superiority

The NSC has reviewed the capability issue in a draft National Security Decision Directive and has recommended industrial base "sufficiency".(27:7) This is a realistic surge objective. Considering the declining nature of the Soviet threat, it is unlikely that resources would be made available to achieve the higher capability levels. So while the industrial mobilization objective is qualitative and quantitative superiority, the objective for industrial surge is to have the flexibility to produce a "sufficient" quantity of qualitatively superior materiel to support variable contingencies. Attaining this goal requires a better articulation of surge requirements than we have provided in the past.

Surge Requirements

Identifying surge requirements returns us to the ubiquitous issues of quantity and quality. Planners have wrestled with this issue for years, but working surge requirements independent of mobilization requirements makes the task easier. The quality of surged materiel is the easier part. The American people have never been happy with anything but the best. The technological capability of potential threats becomes a moot point if we continue to strive for putting the most advanced equipment possible in the hands of our servicemen and women.

Base Force and Sustainment Level Dictates Quantity

The quantity we must surge is the tougher issue. It requires knowledge of the end-state of the down-sized armed services. Current planning suggests that FY 95 force levels will be 18 divisions, 26 tactical fighter wings, and 451 ships. (26:na) With the base force identified, surge requirements are driven by two scenarios: 1) employment of contingency forces (a designated portion of the base force) for X-period of time; or, 2) reconstitution (expansion) of the armed forces structure up to Y-levels for Z-period of time to combat a global threat. The Y-level may be our 1988 force structure, the highwater mark of the Reagan buildup. (26:na) The X and Z periods are affordable levels of sustainment. This is measured in days (from 30 to 180, for example), and reflects what the defense budget can bear. The exact force mixture, intensity of operations, days of sustainment required, and the sophistication of the threat is problematical and will engender lively debates. However, once these figures are set, both DOD and industry can calculate the amount of food, fuel, ammunition, weapons systems, and repair parts that will be required. Comparing these requirements to industry's ability to produce them, provides a mark on the wall and is the basis for programs that will redress surge capability shortfalls. U.S. contribution to allies must also be factored into the calculations.

Foreign Dependency

The foreign dependency issue must be another element of industrial base strategy. Today, self-sufficiency is unattainable, if it ever was. Global economic interdependence is a fact. That interdependence will grow as the European Community removes trade barriers in 1992, as the Pacific Rim countries grow in stature as trading partners, and as the Eastern European countries continue their difficult transformation to free enterprise systems. Clearly, our dependence on foreign oil and other strategic minerals such as columbium, sheet mica, strontium, and titantium makes material self-sufficiency impossible. (18:26)

U.S. foreign dependence for a number of high-technology manufactured products also has major economic and military implications. Options for dealing with foreign dependency are limited. One either accepts dependency as a fact of life, or attempts to break the dependency by a combination of stockpiling and industrial development. If the former course is inevitable because the latter is prohibitively expensive, then the end-state must recognize and work around a certain amount of foreign dependency. Our national security strategy must accomodate economic interdependence and the foreign dependence which it brings.

Impact of Dependence on Economy and Military

Foreign dependency has always posed a more serious economic than military threat. The 1974 Arab oil embargo and the recent crisis in the Gulf underscore the economic impact of oil dependency. The impact of resource dependency on the military has never been demonstrated except in economic terms (higher cost). The U.S. must import 90% of the chromium it uses; but between 1975 and 1978, the height of the Cold War, the Soviet Union supplied 12% of our imports.(18:26) South Africa, a country with which we have shared a cool relationship and punitive trade policies, supplied a significant share of the manganese, chromium, platinum group metals, and antimony that we imported during that same period.(18:26)

Raw Materials Dependence

Raw material dependency is a fact and stockpiling of critical raw materials is the only practical alternative. Sufficient access to critical raw materials is essential to peacetime commerce and wartime production. FEMA managed the stockpiles until 1988.(5:na) Now the Secretary of Defense sets policy for the strategic stockpiles and the Defense Logistics Agency manages them.(26:na) The stockpiles have been politicized, however, and contain many items such as silver, which have little or no strategic value in there present form.(5:na) What is stockpiled and who is responsible should be revisited.

Weapons Systems Dependence

Military dependency on foreign manufactured products is a relatively new concern. The National Science Board has reported that the U.S. is dependent on foreign manufactured components for some primary weapons systems; included are tactical missiles such as Maverick, Sidewinder, Sparrow, and TOW.(44:2) Joint Logistics Commanders' reports have identified foreign dependence on components for the M1 tank, F-16, F/A-18, and OH-58D helicopter.(17:3) In 1987, a total of 21 weapons systems were reliant on foreign parts.(19:46,47) Pervasive dependence was for special-process materials and minor (but important) component parts. In 1989 the materials and small parts included glass, sapphire, high-purity silicon, ferrite cores, and field effect transistors.(4:52) The list changes rapidly, however. While we trade with our potential adversaries and competitors in a peacetime environment, wartime commerce is not assured. Developing economic and military strategy objectives for foreign dependency is a difficult task which may be situation and source dependent.

Economic/Mobilization Dependence Objectives

Manufactured product dependence objectives of economic and mobilization strategies should recognize the world-wide trend toward interdependence. Appropriate objectives become: have fewer dependencies than competitors and secure critical vulnerable dependencies.(4:ix) The first objective dictates that the U.S. world-wide market share across the spectrum of industry should be greater than that held by any economic competitor. There is an element of uncertainty here. The underlying assumption is that in a national emergency or war, the country with the fewest foreign dependencies will be able to respond best to mobilization production demands. Securing vulnerable dependencies is best done by developing common interests and trade agreements. Canadian TNT production capacity is important for U.S. munitions planning.(24:11) The North American Defense Industrial Base (US-Canada) is an example of how special relationship and

geographic proximity can secure critical dependencies.(4:11)

Surge Dependence Objectives: Which Alternative(s)?

Stockpiling or production capability are the options in debating military hardware and manufactured products. Draft NSC policy advocates dependency only where treaty commitments are in place and recommends that the U.S. achieve the capability to go it alone using domestic sources for unilateral actions.(27:26) Of course, it is hard to predict when our allies will support us, so a domestic capability implies self-sufficiency across-the-board. Economically, this may be infeasible. Domestic surge capability must be preserved for the most critical products. Sematech is an example of the cost associated with breaking foreign dependency bonds at the sectoral level. The military should opt for production capability in lieu of stockpiling. Exceptions (a decision to stockpile) should be made for products only when technological improvements are doubtful or are of limited utility. Recent examples from Desert Shield/Storm suggest that desert pattern camouflage uniform material (not finished uniforms) and chemical defense equipment should have been stockpiled.(16:na) Hindsight is perfect, but stockpiling these items is cheaper than maintaining idle production capacity.

Dollars are the primary consideration in this debate. Food and ammunition can be stored with reasonable assurance that technological breakthroughs are not on the horizon. The individual items are relatively inexpensive. This is not the case with tanks and airplanes. The best use of stockpiles is for the raw materials, items needing long-lead time, and the foreign manufactured parts from which end-items are made. Some war reserves are necessary, but a responsive industrial base is more economical.

Defining Agency Responsibility

Somebody has to be in charge. Currently, the players are many and their interests are parochial. New agencies and more government are not the solution.

Redefining who is responsible for what will go a long way toward taking that first important step toward improvement. A number of studies have called for a "surge czar", someone to take charge of satisfying national security requirements in situations short of declared war or national emergency.(1:xi) Attempts to establish a czar are not popularly received in "turf-conscious" Washington.(33:8) Turf objections notwithstanding, single agency responsibility for industrial mobilization and industrial surge would facilitate strategy development and implementation. The Secretaries of Commerce and Defense are well suited, respectively, for the mobilization and surge czar roles.

The Department of Commerce is the best choice for implementing national economic and industrial mobilization strategies. There is a cause-and-effect relationship between the economy and industrial mobilization. Commerce already has the lead for the industrial base according to EO 12656. DOC would concentrate on industry-wide mobilization initiatives. Responsibility for science and technology must also be part of the charter. Commerce is currently a minor player in these areas. It is interesting that the United States is the only major industrialized country without the equivalent of a minister of trade and industry or science and technology who has single-agency, cabinet-level responsibility for research and technology programs.(20:130) Implementing economic and industrial policies which have the desired effect will be difficult. Free market proponents will continue to prevail unless significant threats to national security can be demonstrated.

The scope of DOD responsibility for the industrial base is smaller under this reorganization. DOD's orientation becomes surge capability and it works at the industry and sector levels.

FEMA currently has coordinating responsibility for both surge and mobilization and it should keep that mission. "FEMA, with NSC approval, coordinates for the 27 Departments and Agencies which have emergency

functions."(33:8) Under the structure proposed, FEMA would still get policy and strategy guidance from the NSC, but instead of coordinating programs across all executive agencies, it would work through Commerce for industrial mobilization and Defense for industrial surge. In addition to interagency coordination, FEMA would pick up the mission of integrating the surge and mobilization plans at national level.

IMPLEMENTING ESSENTIAL PROGRAMS AND REFORMS

Economic Programs

Discussion of programs to enhance economic superiority is beyond the scope of this paper, but some key points need to be made. The federal budget must be balanced to arrest growth of the national debt. At the same time, programs (tax and investment incentives, capital investment policy, exploitation and marketing of technology) need to stimulate real growth of the U.S. economy. Over time, continued growth will result in a gross national product that dwarfs the frozen national debt and that debt can be retired. The key to continued growth hinges on industrial competitiveness. If the U.S. can learn to quickly market the leading-edge technology that it frequently develops, then there is no one with whom to compete. A temporary market monopoly is achieved. Continued R&D may result in product improvements which perpetuate a quality monopoly for the product. Ultimately, shares of the market will be lost to competitors, but aggressive marketing and exploitation of leading-edge technology across the manufacturing base, will result in a commanding economic position.

Relook Strategic Stockpiles

A program to restudy and restock the strategic and critical materials stockpile complements market competitiveness. Exploitation of new technologies promises to change and increase the criticality of raw materials. The economic

affluence which a technologically competitive industrial base provides, when coupled with an adequate reserve of raw and semi-processed materials, will provide the industrial mobilization capability that has been so elusive.

National Security Resources Board

Programs to attain mobilization and surge objectives may compete for funding. Reestablishment of a National Security Resources Board (or equivalent) can play a pivotal role in deconflicting competing requirements.(26:na) If ODM-type authority is not vested in a single agency, then establishment of a board to set priorities is essential.

Technology Agenda

A national technology agenda must be prepared.(4:x) Greater synchronization of private, commercial, and federal RDTE activities is required. Commercial application of technology frequently precedes military application when an economy is healthy and the industrial base is competitive. This is occurring less frequently in the United States. At the very least, defense and national R&D policy must be integrated and the exploration of dual-purpose technologies expanded.(4:81) Process technology must receive increased emphasis. Technological superiority in production processes provides market competitiveness for industry. Continued vigorous pursuit of the DOD Critical Technologies Plan, with added focus on dual-purpose technologies, appears to offer the highest probability of leading-edge technology application.

Modernization Programs

Modernization programs are the end-item application of new technology from the RDTE community. Modernization of the industrial base is tied to profits, incentives, and economic initiatives beyond the scope of this paper. Plant modernization has not been occurring and new programs must get it started.

The key to military modernization is to keep it going and well managed. The quantity and speed with which modernization progresses has a direct impact on

force readiness and on the size and technology level of plants producing the product. Modernization programs may create an industrial base segment where none existed. Large buys over short periods will increase the capacity of plants and/or require modernization of existing production facilities to achieve greater efficiency. That enhances the industrial base in the short term. However, program termination, which ultimately must occur, has the effect of potentially shrinking the production base. Careful consideration of procurement impact on the industrial base should become a part of the acquisition process.

Product Improvements

Product improvements occur when a fielded system is modified. Product improvements are important to the industrial base because they keep plants operating, even if at warm status. A decision to not complete the A1 modification to the M1 Abrams main battle tank and not to proceed with the A2 modification could result in closing this nation's only tank production facility by 1993.(31:na) The decision to continue with the Longbow modification to the Apache helicopter could keep the AH-64 production line open through the current POM years (1997).(31:na) Obviously, some trade-off of procurement dollars between new systems and modification of existing systems must be made. Impact on the industrial base must receive more consideration as part of the acquisition process.(6:70)

Procurement Procedures

DOD acquisition procedures must consider the industrial base. The Ichord Panel and the GAO have done a thorough job documenting the cause-and-effect relationships. The "hodge-podge" of laws and regulations which have evolved over the last two decades must be streamlined and unnecessary proscriptions discarded.(43:44) There are numerous areas where changes would benefit the industrial base, but three stand out--source selection, contract length, and product specifications.

Selected Source Contracts

Source selection is probably the single most powerful tool that DOD has to indirectly influence the industrial base. Competitive bidding procedures, implemented under McNamara during the Vietnam war, helped reduce procurement costs. They also abrogated many long-standing production agreements with industry and drove producers out of the defense industrial base. These procedures, still in effect today, have dampened spiraling acquisition costs; but they have also had a negative impact on the industrial base. A potential producer may be willing to maintain portions of a defense plant idle, if a binding agreement is in place for the government to procure from the facility during crisis. Potential producers have no such assurance under competitive bidding procedures. Defense production is not profitable and planning for defense production is not taken seriously.(41:16) DOD could reverse this condition by selectively awarding contracts to retain critical producers in the industrial base. DOD had the authority to do this under the Armed Forces Procurement Act of 1947.(46:9) Not surprising in the cost-conscious environment of the 1980s, neither the Ichord Panel nor the Packard Commission made such a recommendation. However, that authority, judiciously applied to critical industry and sectors of the defense industrial base, might preclude Sematech-type reactions (\$500 million annually) to reestablish an entire sector that has been lost.

Multiyear Contracts

The object of the contract length option is to extend the period of time the manufacturer produces his product for the government. In the near-term, this keeps production lines open and maximizes industrial response. Perhaps more important, it gives the manufacturer incentive for competing for government contracts and for modernizing manufacturing processes. DOD and reformers would like to see multiyear defense budgets and appropriations because they would provide greater budget flexibility to the Pentagon and provide large dollar

incentives to potential defense contractors. Congress is unlikely to relinquish annual purse strings, however. The Ichord Panel recommended multiyear contracting up to 5 years as another alternative.(18:31) This procedure essentially extends a single year's appropriation over multiple years for contracting purposes. It has had the desired effect, but DOD has not used this option extensively.

Non-military Specifications

The third adjustment in the procurement arena deals with military specifications. Rigid (and often ambitious) military specifications drive up costs and discourage contractor participation in the defense supply business. Frequently, there are important reasons for military specifications, but logistics planners concede that acquisition time is shortened significantly when a commercial product can be used off-the-shelf for military application. The transportation problems during Desert Shield may never have occurred if the military relied on commercial specifications for canned and packaged foods.(15:2) Using commercial specifications and off-the-shelf products not only reduce costs, they increase the number of defense producers. In 1986 the Packard Commission noted that defense acquisition was the largest business in the world, totalling almost \$170 billion--larger than the combined purchases of General Motors, EXXON, and IBM.(6:43) By relaxing unnecessary military specifications, significant dollars could be redirected across the industrial base--supporting both military and economic objectives.

Direct Funding for Industrial Preparedness

DOD also has programs which place defense dollars directly into the industrial base. Operation and maintenance of GOGO and GOCO plants are an example, but these are maintained on the fringe, usually to satisfy current requirements. Smaller sums are provided for true industrial preparedness programs and these deserve review. Direct funding support is broadly grouped into four areas--incentive programs, quasi-subsidies, stockpiling, and capacity investment.

Each can play an important role in addressing specific aspects of the industrial base problem.

Incentive Programs

The Industrial Modernization Incentive Program (IMIP) and the Manufacturing Technology Program (MANTECH) are the best examples of incentive programs. IMIP is given credit for reducing some acquisition costs through efficiency improvements, but has made little contribution to improving industrial preparedness. MANTECH has failed to make any significant contribution toward production process modernization. Neither program will achieve DOD expectations until industry abandons the short-term strategy on investment returns.(23:11) Profits are the issue and DOD is ill-equipped to provide the kind of incentives required. It is an economic problem that requires an economic solution. The Ichord Panel recommended legislative solutions for this aspect of the problem. The panel cited a need for incentives ranging from revised tax laws to allow more rapid plant depreciation to examination of the cost-benefit ratio of safety, environmental, health, and other regulations which make dealing with the government unprofitable.(18:42) The essential ingredient is legislative reform.

Quasi-subsidies

The Sematech enterprise is the first example of a DOD quasi-subsidy on a large scale. Many have hailed this initiative because of its uniqueness and its magnitude. It avoided the "industrial policy" axe. The objective, to recapture the semiconductor market from Japan by developing advanced manufacturing technology, is clearly an economic one. Military benefits do accrue, but only indirectly. Market leadership and industrial profitability over the long haul are economic problems which require an economic solution.

Stockpiling

Stockpiling is the third category of direct investment. Stockpiling of strategic and critical raw materials for economic and military security should be

accomplished as part of economic strategy. Since the time required to convert many raw materials into usable military end-items can be significant, raw materials play a more important role during industrial mobilization. DOD should get out of the business of managing the strategic stockpiles and concentrate on surge stockpile requirements.

End-items can be stockpiled, but that is expensive and locks the military into the current level of technology. War reserve stocks and prepositioned equipment, such as the Army's POMCUS (Prepositioned Organization Material Configured to Unit Sets) and the Marine Corps' MPS (Maritime Prepositioning Ships) are end-items acquired for readiness and sustainability purposes, but they could be used to complement industrial base shortfalls under certain conditions. While investment in production capability is usually more economical than stockpiling, laying away sufficient quantities of critical parts, components, and assemblies from which the end-items are made is a prudent investment, especially when foreign dependency and long-lead times are the issues. In 1985, the Air Force reported that production lead time for the F-100 engine could be reduced by 15 months by advanced procurement and stockpiling of critical parts.(45:2) Investment in surge parts is inadequate. Annual allocation is in the \$100 million range.(45:7) In 1985, the Army was programmed at \$25 million for TOW II parts, but the Congress only appropriated \$16.2 million.(45:8) The whole concept of what is stockpiled and in what quantity needs to be reviewed based on reappraisal of military threats and surge requirements.

Production Capacity

The final category of direct funding support for industrial preparedness is to invest directly in production capacity. Such investment can expand production capacity or provide a capacity where none exists to negate foreign dependence. Investment in excess capacity was done extensively in the early 1950s.(12:4-10) We have not invested in new capacity for the last 30 years, nor have we

maintained the capacity which we do have. Inadequate funding support of active, semi-active, and inactive GOGO plants best demonstrates this point. We have also failed to invest in developing capacity to break foreign dependence. Capacity alone does not guarantee capability to produce, but it is an essential component.

Revising Plans

Revision of plans, policies, and laws are necessary if new strategies are to succeed. Plans must be refocused along functional lines of responsibility. DOD's Joint Industrial Mobilization Planning Process (4:12) and numerous Industrial Preparedness Measures (IPMs) address everything from critical technologies to ammunition production. All plans consider the full range of production, from current needs through mobilization. DOD should revise its plans to concentrate on expanding current production to meet surge requirement levels. Commerce should focus on mobilization production as part of a larger economic readiness plan. FEMA then becomes the total industrial base preparedness coordinator and ensures that surge and mobilization plans are not working at cross purposes.

Integration of the plans is best accomplished through the Graduated Mobilization Response (GMR) Planning Guidance issued by FEMA in August 1990. This document delineates, in three phases, the necessary planning and execution functions across the federal government. It describes the Joint Industrial Mobilization Planning Model and a model for Resolution of Capacity Shortfalls. A prototype plan for the Department of Energy lays out a sequence of responses for emergencies ranging from domestic disruption of energy supplies to international petroleum shortfalls.(14:1-3) The focus of GMR is mobilization, as evidenced by DOD's decision to not use it for Desert Shield, but for the first time there is a planning document that lays out a flexible approach to transitioning from peacetime to global war. GMR is easily revised to accommodate and integrate the separation of surge and mobilization responsibilities.

Revising Policies

Industrial base policies are plentiful at all levels. At the national level they are embodied in a series of Executive Orders. Executive Order 12656 is one of the most important; it assigns preparedness responsibilities and makes FEMA responsible for "coordinating" industrial preparedness initiatives with all federal departments and agencies. EO 12656 was the authority for FEMA to implement GMR. As has been the case since the demise of ODM, there is no directive authority--the real power to make things happen in the executive branch. National policy documents must be revised to reflect viable strategy objectives, new organization and responsibilities, and to empower those responsible with the authorities required.

De-politicize the Defense Production Act

The Defense Production Act of 1950 was an essential element of our industrial preparedness efforts of the 1950s. Four of the 7 titles of that act have been repealed, and 6 of the major authorities in the remaining titles have either been repealed, restricted, or replaced.(12:6-13) Periodic reauthorization of the remaining provisions has been politicized by Congress, which attempts to add sensitive riders and pet projects to the legislation.(8:8A) In October 1990, Congress failed to reauthorize the DPA because of issues unrelated to the essential war powers that the act was created to provide. This forced the President to rely upon vague and obscure laws to issue EO 12742 to support Desert Shield. The ability to direct prompt delivery of goods is an essential war power which was available in DPA.(3:4) Valuable time was lost in the process. The DPA reauthorization process must be freed from the encumbrance of special-interests politics.

Other Legislative Reform

Tax laws and other economic incentives will require legislative reform. As the Ichord Panel pointed out, there are tremendous economic disincentives

associated with defense contracting. Many of these result from safety and environmental laws and federal procurement regulations. Even the rather mundane process of gathering information to determine the extent of foreign dependency is hampered by federal law. The GAO reported in 1989, that OMB blocked a Census Bureau survey of the industrial base (developed by DOD) that would determine the extent of subcontracting offshore. The denial was based on the Paperwork Reduction Act of 1980 and cited ". . . inadequate consultation with industry in devising the survey." (44:8) Significant improvement in industrial base preparedness will require more than House appropriations. A complete review of laws intended to facilitate industrial preparedness and those in place inhibiting preparedness must be made. Reform is absolutely essential.

CHAPTER FIVE: CONCLUSIONS AND SUMMARY

CONCLUSIONS ABOUT INDUSTRIAL BASE PREPAREDNESS

The industrial base problem is real and efforts to fix the problem have fallen short. Still, analysis permits some fundamental conclusions about industrial base preparedness.

1) Industrial base preparedness is an achievable goal. This is especially true for surge capability: "The current state of the art permits surge planning in detail . . . and spending the necessary resources to build surge capacity into existing contracts." (4:72) We obtained industrial base preparedness in the 1950s because there was a real and imminent military threat to our survival.

2) Economic competitors pose a larger threat to U.S. security in the 1990s than potential military adversaries. The national security strategy of the United States must accomodate this change in orientation.

3) Deterioration of the industrial base is real, significant, and getting worse. This condition mirrors, to a large degree, the health of the economy and economic infrastructure of the United States. Implicit in this statement is the assumption that a healthy U.S. economy will provide an industrial base that can respond to mobilization requirements.

4) Recognizing the relationship between the economy, the industrial base, and the industrial base's ability to support the military is foremost in devising solutions to the industrial base problem. The industrial base is the linkage between economic and military power. Decline of the industrial base is an economic problem with serious implications for the military. Over-reliance on DOD to achieve industrial base preparedness is misplaced and a major inhibitor to solving the problem at its source--the economy.

5) We have no viable strategies for making the industrial base healthy. Objectives are numerous, but frequently developed in an uncoordinated fashion. There are few programs in effect aimed at achieving industrial base objectives. The allocation of resources (primarily dollars) to support those programs is insufficient for achieving meaningful improvement, let alone the objectives themselves.

6) Remedies for achieving industrial mobilization capability must be broader and more visionary than remedies for industrial surge capability. A functional breakout of responsibilities and program orientation is needed.

ESSENTIAL COMPONENTS FOR SUCCESS

Organizing for Success: Assigning Responsibility

Fixing the industrial base will require leadership and a better focused and organized federal government. Somebody has to be in charge, with responsibility and authority commensurate with the task. The problem is so large and complex that sub-division of tasks facilitates mission accomplishment. Commerce and Defense have been unsuccessful in obtaining significant results under the existing framework of shared responsibility. DOD should be responsible for industrial surge, working with extant industry, or developing new industry or stockpile-type solutions where there are surge shortfalls for peacetime contingency requirements. The Department of Commerce, with additional oversight for science and technology, should be responsible for industrial mobilization and the broader issues of the economy. Coordination with other government agencies and integration of industrial surge and industrial mobilization initiatives should be vested in FEMA.

Sensing Reality

Formulation of programs to achieve national industrial base objectives need

to be in touch with political reality. First, the conventional military threat does not justify sizable outlays for preparedness programs. The nature of the threat and the warning time have changed considerably since NSC-68 was issued. Reality is that " . . . the ability to surge is more a matter of policy choice than ability."(4:ix) The threat upon which the national will can be coalesced is posed by economic competitors, Soviet military might notwithstanding. Second, there is strong political aversion to industrial policy. Economic and industrial preparedness programs which reduce free market incentives are inherently less likely to gain acceptance unless the economic threat can be dramatically demonstrated. Third, some, if not all of the problems can be solved.

Clear Objectives

Strategies need to begin with a clear statement of objectives. Industrial mobilization preparedness is achieved through an economic strategy aimed at enhancing U.S. economic superiority. An objective of economic strategy must be to achieve leadership market positions world-wide, especially across the high technology industrial sectors. This allows us to leverage the leading-edge technology we are so good at pioneering in the R&D community. The key to industrial leadership is developing mechanisms to commercially market new technologies quickly. Industrial surge objectives have a military orientation. Surge objectives must strive for an industrial base that is flexible enough and capable enough to provide a sufficient quantity of technologically superior equipment across the broad spectrum of potential scenarios and adversaries. The cornerstone of both economic and military strategy is technological superiority. Clearly, the United States needs to devise a technology master plan.

Develop Affordable Programs

Programs to enhance industrial preparedness must begin anew with efforts to identify and articulate requirements to industry. Capability shortfalls must be accurately identified to put scarce dollars most effectively to work. The key is

a healthy, robust, and growing U.S. economy. Program solutions to achieve this are difficult, but essential. Legislative reform is also required to achieve both economic and military objectives. Reassessing and restocking the strategic stockpiles supports both economic and military preparedness. DOD must revise procurement procedures, with Congress' help, to spread the defense dollar over a broader portion of the defense industrial base. R&D investment should be protected in the defense budget. In the procurement account, a mix of new systems and product improved systems must be preserved to keep the extant industrial base active or semi-active. Greater reliance on commercial specifications and off-the-shelf products will further expand the number of potential contractors from which surge requirements can be met. DOD should invest in creating production capability as a more economical alternative to stockpiling. Where stockpiling is required, preference should be to parts and components instead of end-items. Maintenance and modernization of GOGO and GOCO plants can be deferred no longer. Meaningful steps must be taken to preserve and enhance the government-owned portion of the industrial base.

SUMMARY OF MAJOR ISSUES AND RECOMMENDATIONS

ABETTING PRESSURES, OBSTACLES, AND VARIABLES TO IMPROVING PREPAREDNESS

Pressures

- *Insufficient priority and urgency
- *Extant procurement procedures and budget process
- *Failing industrial competitiveness and growing economic interdependence
- *Escalating costs and levels of technology

Obstacles

- *Requirements determination
- *Aversion to economic (industrial) policy
- *Misunderstanding industrial base linkage
- *Diminishing threat
- *Diffused responsibility
- *Absence of strategies

Variables That Complicate Solutions

- *Force structure and modernization
- *Threat type, magnitude, and warning time
- *Changing military strategy
- *U.S. economy

DEPARTMENT OF COMMERCE RESPONSIBILITIES

Strategies

national economic

Objectives

enhance global economic superiority
leadership in global markets (largest fraction)
product and process technology superiority

industrial mobilization

production capability (quantity) superiority
product and process technology superiority
fewer and smaller foreign dependencies than foes

Required to obtain objectives: provide strong leadership and adequate priority; articulate economic threat clearly and coalesce the national will; integrate national economic and national security strategies; review and revise legislation; implement national economic programs; provide incentives for industry to modernize and be competitive in world markets; focus responsibility and authority (federal reorganization); coordinate and consolidate responsibility for R&D and science and technology; develop dual-purpose technologies; review and restock strategic and critical material stockpiles (transfer responsibility from DOD).

DEPARTMENT OF DEFENSE RESPONSIBILITIES

Strategies

industrial surge

Objectives

flexible response capability
production capability (quantity) sufficiency
product technology superiority

Required to obtain objectives: provide strong leadership and adequate priority; review and revise legislation; better identify surge requirements; revise procurement procedures; make defense contracting efficient, economical, and profitable; relax military specifications and increase use of commercial products and specifications; set high priority for R&D and development of dual-purpose technologies; continue modernization and product improvement of weapons systems; invest in production capability for critical items; selectively stockpile long-lead time and offshore parts and components; maintain and modernize GOGO and GOCO plants.

FEDERAL EMERGENCY MANAGEMENT AGENCY RESPONSIBILITIES

Retain coordinator role. Given additional responsibility for integrating Commerce's industrial mobilization strategy and Defense's industrial surge strategy. Continues refinement of Graduated Mobilization Response.

CLOSING

Industrial base deterioration is symptomatic of the more serious decay of the U.S. economy. Solutions to industrial base problems start with the fundamental admission that it is first, and foremost, an economic problem. The lion's share of the solution must come from our civilian leadership and economists, not soldiers. The serious threats posed by economic competitors and declining technological leadership must be recognized. Make no mistake. The national security of the United States is threatened and it is time we do something about it.

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