United States General Accounting Office

GAO

Testimony

Before the Subcommittee on Defense Industry and Technology,
Committee on Armed Services,
United States Senate

For Release on Delivery
Expected at
2:30 p.m., EDT
Thursday,
May 21, 1992

NATIONAL DEFENSE STOCKPILE

Comments on DOD's 1992 Report to the Congress and Proposed Legislation

Statement of Donna M. Heivilin, Director, Logistics Issues,
National Security and International Affairs Division

Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to discuss our views on (1) the assumptions and analyses contained in the Department of Defense's (DOD) 1992 Report to the Congress on National Defense Stockpile Requirements, (2) DOD's recommended disposal plans and associated legislative proposals and (3) the U.S. ferroalloy upgrading program. We will also discuss agency actions on prior GAO recommendations, and the participation of federal agencies and other experts in the stockpile determination process.

DOD's most recent report on stockpile requirements was released about 3 months ago, on February 27, 1992. Accordingly, our comments are preliminary in nature. We will provide a more complete assessment in our report which we will issued later this year.

RESULTS IN BRIEF

Our preliminary assessment indicates that DOD has made an effort to improve its methodology for estimating stockpile requirements. However, the process used, taken in its overall context, is limited as a basis for determining specific estimates of stockpile requirements. We are most concerned about the representation of uncertainty associated with goal estimates and the use of outdated data in the models. Although these shortcomings cast doubt on the specifics of DOD's proposed requirements goals, changes in the U.S. security threats, reductions in force structure, and increasing warning times indicate that cautious disposal of some material is prudent. At the same time, these factors also tend to support a temporary curtailment of uncommitted purchases until better estimates of requirements are developed.

After reviewing the different disposal plans, we believe that DOD can proceed with most proposed disposals until a new stockpile study is produced that incorporates updated material consumption ratios (MCRs) and more thorough sensitivity analyses. Specifically, we see no need to retain generally recognized obsolete materials such as certain forms of asbestos, vegetable tannins, and thorium nitrate, or materials that are of an inferior grade by today's standards. So as to carefully consider market impacts, we suggest that DOD dispose of materials such as cobalt, ferroalloys, chromium, and manganese ores after full consultation with experts in other federal agencies, and with producers and users, as appropriate.

Before discussing these points further, some background information on the stockpile and the DOD report may be helpful.

NATIONAL DEFENSE STOCKPILE

In 1946, Congress enacted the Strategic and Critical Materials Stock Piling Act, which authorized the present stockpile. Strategic and critical materials are those materials that are needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency and that are not likely to be produced domestically at levels sufficient to meet those needs. The current stockpile is composed of 91 strategic and critical materials, including aluminum, beryllium, chromium, cobalt, germanium, industrial diamonds, manganese, and platinum. In February 1988, management of the stockpile was transferred by executive order from the General Services Administration and the Federal Emergency Management Agency (FEMA) to the Department of Defense.

Stockpile goals represent the projected minimum quantities needed to sustain military, industrial, and civilian requirements for a 3-year period during a conventional war of indefinite duration, as directed in legislation. A number of stockpile policy reassessments and goal studies have been done over the years. However, alternative requirements and assumptions used in previous studies have resulted in wide variations in proposed goals. At January 1991 prices, these variations in proposed goals ranged from more than $16 billion in 1979 to about $600 million in 1985 to over $5 billion in 1991 and finally to $3.3 billion in 1992. The current actual goals are an updated version of the 1979 goals and are valued at $19.1 billion. The existing inventory is valued at $8.9 billion, using September 1991 price information, but contains too much of some material and not enough of others to meet the 1992 proposed goals.

To determine requirements, DOD computes the amounts of inventory that exceed or do not meet proposed goals. Under the 3-year war scenario, DOD determined that 11 materials valued at about $1.2 billion would need to be acquired to meet proposed goals. However, DOD has proposed a moratorium on stockpile purchases because of the change in threat assessments and the desire to save money as defense budgets decrease. DOD has also proposed an alternative war scenario, which it considers more realistic, and has computed a goal of $1.32 billion. This scenario assumes a 1-year mobilization period and a 3-month war. We note, however, that DOD's alternative includes acquisitions of seven stockpile materials valued at $195 million.

ASSUMPTIONS USED TO DETERMINE STOCKPILE REQUIREMENTS

The Strategic and Critical Materials Stock Piling Act requires the Secretary of Defense to submit an annual report on stockpile requirements based upon total mobilization of the U.S. economy for a sustained conventional global war for a period of not less than 3

years. The act also describes certain assumptions that DOD should use in determining and recommending stockpile requirements. Included are assumptions on military force structure, domestic production of strategic and critical materials, and availability of materials from foreign sources.

War Scenario

War scenarios generally describe the environment before a war, the length of the warning period, the extent of mobilization, the duration of war, the zones of action, and the environment after the war. Although DOD is implementing detailed defense force structure reductions in the range of 25 percent, it has not issued approved defense planning guidance, including planned levels of reconstitution of forces. In effect, there is no officially approved war scenario and designated force structure to meet identified threats.

For the requirements determination process, the Joint Staff provided a war scenario and total mobilization force structure targets, as of January 1991, that took into account the political, economic, and military restructuring in Eastern Europe and the former Soviet Union. The war scenario and force structure used in the models were adapted to the statutorily mandated requirements. According to the Joint Staff, the scenario and force structure provided were for stockpile requirement determination purposes only and were not to be used by other federal civil agencies for mobilization and planning purposes.

In DOD's view, a scenario more consistent with national military strategy would call for a 1-year mobilization period and a 3-month war. DOD's report includes a compilation of requirements using this alternative scenario. DOD cites recent intelligence estimates that indicate further changes in the potential threats to U.S. national security. Since the Joint Staff provided its scenario in January 1991, significant events bearing on U.S. security have occurred, including the dissolution of the Soviet Union and the formation of the Commonwealth of Independent States. These events require a reevaluation of threat assessments, which could lead to further reductions in stockpile goals.

Foreign Country Reliability

The United States is almost entirely dependent on foreign countries for strategic and critical materials such as columbium, manganese, platinum, cobalt, and chromium. The Department of State conducted a reliability assessment of foreign suppliers of strategic and critical materials using a new methodology that rates reliability on a scale of one to six. A rating of one means that a country is likely to be unwilling to supply the United States during a war, while a six means that a country will be capable of producing and delivering to port up to its full existing capability and,

additionally, is likely to take extraordinary measures during war to provide increased supplies. Several DOD groups also reviewed information on country reliability and resolved differences between State ratings and DOD ratings by adopting the more conservative rating of the two. The ratings were then converted to percentages for use in the modeling process.

This rating system is different from the one used in prior assessments. For example, in DOD's 1989 report, each country was rated as completely reliable or completely unreliable in terms of available supplies. The 1985 NSC study assigned one of three reliability ratings to potential exporting countries--highly reliable, fairly reliable, and unreliable.

Department of State officials do not approve of the way DOD uses State's reliability assessments. State officials stress that their assessments are highly subjective and prone to rapid change. They believe that the country ratings are good for a few months at best. They also expressed concern about converting reliability ratings to numerical values or percentages for purposes of estimating available foreign supply of materials. We recognize, however, that the modeling process for determining stockpile goals requires conversion of reliability assessments into numerical factors.

DOD performed sensitivity analyses to determine how changes in foreign country reliability assessments would affect proposed goals. Using previous country reliability assessments, DOD computed a stockpile requirement that was $194 million, or 6 percent lower than the proposed goal. Reducing the reliability assessment for one country by 50 percent increased stockpile requirements by only $5 million.

We believe that DOD's sensitivity analysis does not adequately reflect State's concerns about the uncertainty of the reliability ratings. For example, a country's rating may not change over several rating periods and would therefore not have changed in DOD's sensitivity analysis, but that rating could still be considered uncertain by State. Therefore, alternative ratings should be examined.

Also, we found that country reliability ratings were not imposed on all pertinent sources of material supply. Specifically, for some materials the ratings were imposed only on those countries where the material was processed and not also on those countries where the raw or feedstock material was mined. This means that DOD may have overstated available supply of materials in some instances.

We asked DOD to conduct additional reliability sensitivity tests focused on those country ratings we believed were characterized by substantial uncertainty for the foreseeable future (even though

DOD's current ratings may be appropriate at present).[1] Our tests examined alternative ratings for a number of different countries in different combinations with each other. By lowering the ratings for just a few countries, the estimated goals increased for 9 of the 24 modeled materials with proposed goals (under the 1992 study). Also, we estimated positive goals for two materials that did not have proposed goals. Specifically, for some materials, we estimated goals that were many fold larger than those proposed in the 1992 study. Our estimates suggested goals that were about 50 percent larger in total value than those proposed in the 1992 study. An alternative rating for one key country is largely responsible for this difference.

Some sensitivity analyses on country reliability conducted for previous stockpile studies were more thorough and could result in broader ranges for stockpile goals than we show here. We believe a thorough sensitivity analysis of country reliability should be conducted in combination with other analyses, for example, on shipping losses or material consumption ratios. Such combined analyses are likely to result in broader ranges for proposed goals than those presented in the 1992 study.

Material Consumption Ratios

The limited representation of uncertainty and the use of outdated data characterize the use of material consumption ratios (MCRs) in the study. MCRs are estimates of material consumption per dollar of industry output that are used to convert the estimates of an industry's output into the requirements for a critical material.

In estimating stockpile goals, the model uses over 2,000 MCRs each of which represents a unique combination of industry and critical material. However, less than 200 MCRs are likely to be influential or need to be reasonably accurate to produce a meaningful estimate.

---

[1]Our test results presented here are different from those in our April 29th testimony before the House Armed Services Subcommittee on Seapower and Strategic and Critical Materials because of a DOD programming error. As a result of the error, the reliability rating for one key country did not change when it should have. Consequently, our previous presentation of results substantially understates the effect of this alternative rating on estimated goals.

The 1992 report includes MCRs that are based on data more than 10 years old.[2]

To analyze the consequences of using outdated MCRs, we attempted to obtain the raw data DOD used to construct MCRs. DOD was unable to provide that data because it did not keep historical files or documentation. We did obtain raw data for some of the potentially important MCRs from Commerce data covering 1972-83, but nearly half of the data we requested had been discarded. Our preliminary findings from an analysis of that data suggest that, for the most part, the MCRs used in the 1992 study cannot be verified from surviving data sources. We calculated our MCRs in a manner identical to that described by DOD and found that, of the 15 MCRs we examined, our estimates were within 10 percent of DOD's MCRs for 4, within 20 percent for another 5, and substantially different for the remaining 6.[3]

We also examined how much an MCR could change over 10 years. Among 15 MCRs, 3 increased by more than 4 times their level of a decade ago, 3 had decreased to less than 25 percent of their prior level, 6 were about one-half their prior level, and only 3 had remained about the same.

Such dramatic changes in MCRs over a decade are possible for many reasons, including (1) technological advances, for example miniaturization, which would reduce materials consumption; (2) substitution of alternative or cheaper materials, which could increase consumption of some materials and reduce consumption of others; (3) greater production efficiencies (less waste), which would reduce materials consumption; and (4) changes in the dominance of the various products contained in particular SIC

---

[2]According to DOD, MCRs are calculated as the ratio of 3-years of materials consumption data by industry, obtained from analysts at Commerce, to 3-years of industry output on a product class basis, obtained from the Census of Manufacturers. Commerce last updated the materials consumption data for all materials during 1985-86, which produced estimates for 1983. Allowing for the lag-time in constructing MCRs, estimates for 1989 could have been available for the 1992 study, therefore the MCRs used in the 1992 study were at least 6 years out of date from what was possible. Adding to this the years that the MCRs are projected forward in the 1992 study means that the MCRs applied to the war years are based on data more than a decade old.

[3]We attempted to verify the MCRs used in the 1992 study by constructing comparable MCRs from Commerce data and Census of Manufacturers' actual data, whereas DOD had used forecasts of Census data.

codes,[4] which could increase or decrease the consumption of particular materials.

The results of our examination reflect the uncertainty associated with the use of outdated data for the MCRs. The 1992 study does not reflect this uncertainty in the sensitivity analyses. Further, the 1992 study does not present sensitivity analyses of MCR-related uncertainty that can arise from such factors as inventory level changes, materials price speculation, or the likelihood that wartime MCRs are not comparable to peacetime MCRs.

We asked DOD to conduct sensitivity analyses on 15 estimated MCRs representing 11 different materials, 8 of which have proposed goals from the 1992 report. In most cases, our analysis examined both increases and decreases in the MCRs used by DOD. The amounts we raised and lowered each MCR were determined either from past values of that MCR, according to its variance or extreme values, or our estimate of that MCR if it differed greatly from DOD's. For the 8 materials with proposed goals under the 1992 study, 7 varied upwards by 17 to 55 percent or varied downwards from 25 to nearly 100 percent (a near-zero goal), and one goal nearly tripled or ranged downward to zero. The analyses did not result in positive goals for any of the other three materials. By combining all of our MCR analyses, the total value of proposed goals could range upward by 35 percent or downward by 29 percent.

The sensitivity analyses we conducted were somewhat conservative in that not all materials were examined, nor were plausible extreme values of MCRs tested in each case. Therefore, it is possible that a more thorough analysis would reveal broader ranges for proposed goals. Further, combining analyses of MCRs with analyses of other factors is also likely to result in broader ranges for proposed goals than those suggested by the results of analyses presented in the 1992 study.

We understand that DOD is negotiating with Commerce to update the data used to calculate MCRs. Further, one Commerce official told us that it might take several years to reestablish the level of expertise and cooperative industry relationships that are necessary to collect data comparable in quality to that obtained when MCRs were last updated around 1985. If DOD is unable to obtain new MCR data from Commerce or anyone else on a continuous basis, then we believe the modeling approach to determine stockpile goals may not be credible. Perhaps more reliable estimates could come from a new structure of working groups or committees composed of experts in the relevant subject areas.

---

[4]SIC codes are four-digit standard industry classifications used by the Department of Commerce to categorize economic data on an industry or product basis.

Because any methodology used to determine goals involves assumptions and data that are characterized by some uncertainty, we believe it would be prudent to place less emphasis on computing specific point estimates of stockpile goals and, instead, develop a range of stockpile requirements, sized in volume and value, to cover identified U.S. security threats. Also, in times of uncertainty, looking at alternative goals for one or more war scenarios may be useful. Alternatives can give some sense of the relative risks involved and the range of requirements needed to address those risks.

PROPOSED DISPOSALS

The uncertainty associated with DOD's proposed stockpile goals calls for caution in selling stockpile materials. We believe that with force structure and national security threats coming down, and warning time increasing, opportunities for disposal of some quantities of materials are apparent. Nonetheless, a cautious approach to disposals should be exercised until DOD can produce a stockpile study that incorporates both updated MCRs and more thorough sensitivity analyses. One alternative may be for Congress to allow DOD to proceed with the first two years of any one of several disposal plans currently being proposed. By that time a new study should be available and the existing disposal plan could be adjusted accordingly.

Regardless of which disposal plan is adopted, however, we also believe that more thorough sensitivity tests based on the 1992 study should be conducted prior to the actual disposal of each material. As an example, we conducted a limited sensitivity test and concluded that proposed disposals of six different materials could be considered of high risk from a national security perspective. The disposal of many other materials would be of low risk either because available supply is substantially in excess of demand, they are obsolete, or the material in inventory is of an unusable grade.

Materials Included in Quantitative Modeling

Results from a sensitivity analysis of the stockpile modeling system should provide a reasonable basis for assessing the national security risk associated with proposed disposals. As an example, we asked DOD to conduct a sensitivity analysis that focused only on the country reliability assumption, and we used the results of that analysis to categorize the proposed disposals of each material as

either of low, medium, or high risk.[5] Most proposed disposals were classified as low risk, and none as medium risk. Six were classified as high risk, including proposed disposals of Antimony, Chromite refractory grade, each of three Platinum group metals (Iridium, Palladium, and Platinum), and Tungsten group. We describe our analysis as an example because it is not comprehensive in accounting for the uncertainty in proposed goals that is associated with a variety of other assumptions or data sets that are part of the stockpile modeling system. Nonetheless, we also believe that the results of our analysis are more likely to overstate rather than understate the true risks associated with proposed disposals.[6]

---

[5]For our sensitivity analysis, we reduced the reliability ratings for a number of countries based on our perception of the uncertainty associated with those ratings. If the amount of a given material in inventory minus the proposed disposal was more than 25 percent below our alternative proposed goal, then we classified that proposed disposal as high risk; between 0 and 25 percent was classified medium risk, and 0 percent or below was low risk. The results were not sensitive, however, to the selection of 25 percent, versus say 33 percent, as the cutoff. We adjusted the risk classifications of the disposals of Cobalt and Quartz from medium and high risk to low risk based on what we were told by an official at DLA about the quality or grade of the materials slated for disposal, and their current usefulness for national security purposes.

[6]Taking into account other alternative assumptions or data estimates could alter our classifications of proposed disposals. On the basis of previous DOD and GAO sensitivity analyses, however, we believe that a sensitivity analysis of country reliability is likely to dominate most other sensitivity considerations in resulting in higher alternative proposed goals. Further, our sensitivity tests represent alternative outcomes that we believe are possible but less likely to occur than the base case outcome. Consequently, disposals we classified as risky should be considered as having a positive, but low, probability of compromising national security.

Materials Not Included in Quantitative Modeling

There are 22 materials[7] that were not considered significant enough to the economy to be included in the data bases of the quantitative models. Thus, DOD consulted with experts from other federal agencies and used data collected from available sources to determine requirements for these materials. DOD is seeking to reduce the number of these materials from 22 materials with requirements worth $1,221.2 million to 3 materials with requirements worth $400.7 million at January 1991 prices. The three materials are beryllium metal, diamond industrial stones, and jewel bearing; requirements for the other 19 materials have dropped to zero.

In DOD's 1992 report DOD extensively discussed the reasons for reducing requirements for the 19 materials to zero and the rationale for maintaining requirements for 3 materials. DOD cited the availability of substitutes, declining usage, health and environmental impacts, and unnecessary requirements as reasons for eliminating or dropping goals for the materials. The reasons cited, coupled with the methodology DOD used to determine requirements, appear reasonable to us.

IMPACT OF DISPOSAL PLANS

You asked us to address the impact of DOD's proposed disposals of 51 materials on domestic production. A recognized expert said that a good rule of thumb is disposal of about 5 percent or less of world production during good market conditions.

We believe that disposals should be conducted in a manner that does not unduly disrupt markets, as is now required by existing legislation. We reviewed the proposed disposals of 29 different materials and found that, for the most part, the proposed annual disposals were not likely to unduly disrupt markets, particularly those markets that exhibit rising prices at the time of disposal. For a few of the materials we reviewed, however, proposed annual disposals are of sufficient magnitude that market disruption is a possibility, and especially so if prices are falling at the time of disposal.

---

[7]Chrysotile asbestos, beryllium metal, beryllium copper master alloy, beryl ore, abaca cordage fibers, sisal cordage fibers, diamond industrial stones, iodine, jewel bearings, chemical grade manganese ore, mica-muscovite splittings, mica-phlogophite splittings, pyrethrum, rutile, sebacic acid, thorium nitrate, vegetable tannin extract - chestnut, quebracho and wattle, analgesics, quinidine and quinine.

Experts agree, however, that predicting future market conditions is virtually impossible. An industry expert cited a price swing for cadmium from around $9 a pound in 1988 and 1989 to $1 a pound currently, illustrating the volatility of the market. Some government and industry representatives we contacted were concerned that current markets (with low demands and low prices) could be unduly impacted by substantial stockpile disposals. There were some exceptions, such as silver, cobalt and tin. There may be other exceptions, as we did not individually review all materials. Experts favor disposal of stockpile excesses during escalating market conditions as a means of minimizing the impact on usual markets.

Domestic industry associations and several foreign countries have expressed concern about the proposed disposal plans. There is no domestic primary production for 22 materials, and world primary production significantly exceeds domestic primary production for most materials where information is available. Applying available data, the proposed disposals were compared to world primary production. Using 5 percent per year as a measure of possible adverse market impact, most of the proposed disposals under DOD's two 5-year plans were under 5 percent.[8] DOD's proposed disposal plans do not appear to pose significant problems, given the use of a 5 percent benchmark. However, the fact that we did not have information on all materials, that several materials exceeded the benchmark, and that disparity of market conditions exist among materials, suggest that disposal quantities should be commensurate with market conditions at times of proposed sales.

FEASIBILITY OF DOD's STOCKPILE DISPOSAL PLANS AND ANTICIPATED REVENUES

You requested our views on (1) whether DOD's five-year alternative disposal plans can be carried out in light of past disposal

---

[8]Comparison of the highest proposed disposals in each of the five-year plans to 1990 world production for 29 materials showed:

Plan	3 percent or less	5 percent or less	over 5 percent
First	20	6	3
Second	19	4	6

The first plan included 3 materials that were consistently over the 5 percent per year benchmark (graphite natural/malagasy crystalline, 7.9 percent; mercury, 6 percent; and tin, 5.8 percent). The second plan (DOD's alternative to revise the statutory limitation) included 3 additional materials that often exceeded the per year benchmark (bauxite/metal grade Jamaica, 5.6 percent; cobalt, 5.6 percent; and palladium, 6.9 percent).

activities, and (2) whether projected revenues from the disposal plans are realistic.

The ability of actual disposal proceeds to approximate projected revenues cited in either of the two five-year disposal alternatives is doubtful. The magnitude of proposed disposals is significantly higher than in the past few years, when established dollar limitations were not achieved. However, potential for increased disposal proceeds, above the legislative limitation of $150 million, does exist with the broader listing of materials and quantities that is included in proposed legislation.

Present legislation limits the amount of total stockpile disposals. For fiscal years 1988 and 1992, for example, disposals were limited to the amount of planned obligations, or $126 million and $150 million, respectively. For fiscal years 1989, 1990, and 1991, disposals were allowed up to a maximum of $180 million each year. For fiscal years 1992 and 1993, the limitation was $150 million each year.

DOD's fiscal year 1993 Annual Materials Plan includes two five-year disposal plans, starting in fiscal year 1993. Projected disposals are estimated at $392 for one alternative and $634 billion for the other alternative for fiscal year 1993. Disposals under both alternatives are equal to or less than the computed excesses in DOD's 1992 requirements report. The first alternative is conditioned to the legislative requirement (50 U.S.C. 98d) that disposals not exceed obligations which are planned at $150 million. The second alternative is conditioned to the expectation that a maximum limitation of $1 billion would be legislatively authorized. The estimated disposal values are computed at 80 percent of market prices. The 20 percent discount is intended to compensate for moving (loading and transporting) costs from multiple storage locations to customary marketplace delivery locations. Also included in the discount is a factor for selling without usual material specification guarantees.

DOD's disposal proceeds during the first half of fiscal year 1992 amounted to $58 million. In fiscal years 1991, 1990, 1989, and 1988 disposal proceeds were $83 million, $63 million, $69 million, and $80 million, respectively. In this 4-year period, disposal proceeds ranged from 35 to 64 percent of the dollar limitations.

A total of eight materials represented the major disposals during the four year period. Of these, various combinations of four materials represent 97 percent or more of the total disposal proceeds each year. These include silver transferred to the Treasury for designated coinage programs and tin transferred to ferroalloy contractors under barter agreements that partially offset costs of upgrading programs. Actual disposals of the four materials were generally below the authorized quantities and estimated prices during the past four fiscal years. To illustrate,

about $443 million was authorized for disposal and about $290 million was actually sold over those four years. The difference of $153 million represents $115 million in lower quantities sold, and $38 million in lower prices received.

Reduced quantities of disposals resulted from factors such as (1) the limited amount of material necessary for the approved coinage programs, (2) the legislative requirement (50 U.S.C. 98e) that disposal should avoid disruptions of the usual markets to the extent possible, and (3) the lower demand for materials that do not meet current market specifications. A couple of experts confirmed the fact that some stockpile materials deteriorate in storage and were purchased under market specifications that have become more stringent. Lower disposal prices resulted from several factors such as (1) the market price volatility, (2) difficulty in predicting the market price adjustments for moving costs, (3) selling material without the usual material specification guarantees.

THE PLANNING AND DISPOSAL PROCESS

DOD is required by Executive Order 12626, dated February 25, 1988, to consult with heads of cognizant agencies in the disposal planning process. DOD officials said representatives in other agencies were contacted during their planning process, but the experts we contacted in other federal agencies said they were not consulted on DOD's 5-year disposal alternatives.

We favor a broad, flexible, longer term disposal plan, subject to annual congressional review and approval, that maximizes the number of excess materials authorized for disposal and provides flexibility in quantities sold. Such a plan should be readily adjustable to accommodate disposals in consonance with market conditions and without undue disruptions of the commodity markets.

DOD should obtain the counsel the of civil federal agency and independent experts in planning and implementing any disposal program because (1) proposed disposals would significantly exceed prior experience with annual disposals, and (2) the timing of disposals in the volatile minerals and metals markets is critical to ensuring compliance with the legislative requirement to avoid undue disruptions in the usual markets. Advisory committees comprised of individuals with expertise in stockpile materials or in stockpile management should be constituted to advice and counsel stockpile managers.

FERROALLOY UPGRADE PROGRAM

You requested our views on the need to preserve the ferroalloy upgrade program. We understand the 10-year upgrade program began in 1984 under an executive order. The program was subsequently legislated (50 U.S.C. 98d, note) to continue through fiscal year

1993. The law requires procurement of minimum annual quantities and total quantities of high carbon ferrochromium and ferromanganese to be added to the stockpile. These alloys are produced from chromium and manganese ores provided from the stockpile. From 1984 through 1991, about 384,000 and 417,000 short tons of ferrochromium and ferromanganese were purchased for costs of about $324 million and $275 million, respectively, based on replacement costs of the ores.[9] These costs of the upgraded ferrochromium and ferromanganese have exceeded comparable market prices by an average of 25 and 36 percent, respectively, during the 8-year period. Using the original costs paid for the ores many years ago, the cost of the upgraded ferrochromium was $256 million or about 1 percent below market prices; and ferromanganese was $237 million or about 17 percent above market prices.

The current markets for these materials are weak, as supply exceeds demand, according to the producers and Bureau of Mines experts. Domestic consumption of chromium and manganese ferroalloys (low, medium, high carbon, and silicon ferros) decreased from about 420,000 and 563,000 short tons in 1990 to about 360,000 and 449,000 short tons in 1991, respectively.

DOD's fiscal year 1992 annual materials plans include legally required procurements of these alloys along with a proviso that the law be repealed because inventories exceed requirements. In DOD's requirements report, DOD computed significant excesses for these materials and the ores used to produce them. DOD has decided that there is no justification for maintaining the upgrade program. The availability of stockpiled materials, several foreign country sources, and possibly other substitute production facilities were considered sufficient to satisfy envisioned national emergency needs. DOD's 1993 materials plans do not include procurements of these materials.

Each ferroalloy material has a domestic producer, and there is some concern as to the viability of these producers without the government's upgrade program. Senior officers in these two companies expressed differing views on competing in the commercial markets. One officer said his company could not compete in the commercial market alone because of a lack of market share and the currently low market price offered by foreign producers. The

---

[9]Government costs include the value of government furnished ores and the costs to upgrade them. Upgrading costs include contractor barter credits that are accumulated and exchanged for excess materials. For example, during 1991, the ferrochromium contractor used barter credits to obtain 1,080 short tons of tin. During the same period, the ferromanganese contractor used barter credits to obtain 1,848 short tons of tin, 101,308 pounds of chestnut tannin, 65,485 pounds of quebracho tannin, and 200 flasks (76 pounds) of mercury.

official stated that the company's commercial market share has shrunk to such an extent that the government's share represents 80 percent of the company's reduced production. The government's share was 50 percent of production when the company operated at full capacity. The average January price for ferrochromium was $745 per short ton from 1985 through 1987 and only $600 per short ton in January 1992. The other officer believed his company could compete in the commercial market if the government would (1) support a transition period by decreasing the upgrade program at a rate that permits the company to increase its commercial market share and (2) sell stockpiled ore at terms and conditions that would allow for a reasonable profit. The government would have provided for a subsidy of unknown magnitude during the transition period. The Ferroalloys Association favors procurement through 1993 with a subsequent transition program for the producers.

We believe that continued procurement of these ferroalloys is not economical, given the current goals in the 1992 stockpile study and the existing inventories to meet these goals. Also, the fairly large and widespread world production of ferrochromium and ferromanganese among producing and exporting countries indicates that U.S. emergency requirements for these alloys could probably be met without a domestic ferroalloy processing capability.

Using least cost and lessened economic impact as guides, we suggest several approaches for concluding these programs. Such approaches could include evaluations of (1) termination costs of the ferroalloys contracts and the impact on proceeds from subsequent ore and ferroalloy disposals, (2) costs for continuing production contracts to completion and the impact on proceeds from the disposal of reduced excess ores and increased excess ferroalloys at contract completion, and (3) costs associated with promptly starting and expeditiously completing assistance to the contractors for transitioning to the commercial market. These associated costs would include any continued ferroalloy production, impact on proceeds from disposal of ore to contractors at reduced prices, disposal of increased excess ferroalloys created by any continued production, and disposal of reduced ore inventories when assistance would be terminated. The Defense National Stockpile Center has not yet performed these types of evaluations.

ACTIONS ADDRESSING PRIOR GAO RECOMMENDATIONS

In a May 1987 report,[10] we recommended that the Director, FEMA, improve the process used to determine stockpile goals. Specifically, we recommended that the analyses of stockpile requirements (1) be directed and performed by individuals and

---

[10]National Security Council Study Inadequate to Set Stockpile Goals (GAO/NSIAD-87-146, May 4, 1987).

organizations with the requisite experience and expertise, (2) contain direct input from the industries involved in material mining and processing, (3) consider a reasonable range of assumptions and options, (4) fairly present study participants' inputs, (5) verify or supplement economic models with the best available direct measures of material requirements, and (6) use assumptions and planning factors that are consistent with those used by federal departments for similar purposes. In following up on the recommendations, we discussed actions taken with DOD, FEMA, Commerce, the Bureau of Mines and other agencies; however, we looked primarily to DOD, which was assigned overall responsibility for stockpile management in February 1988.

We found that the use of experts and expertise in the development of stockpile requirements listed in DOD's 1992 report was varied. Experts in several federal agencies and outside the government provided essential information and resources used in the requirements estimation process. This information included supply and capacity data provided by the Department of Interior's Bureau of Mines and the Department of Agriculture, demand side data from the Joint Chiefs of Staff, economic forecasts from the Council of Economic Advisers, country reliability assessments from the Department of State, and modeling resources and services from outside contractors. Experts outside of DOD generally did not lead or chair interagency advisory groups, working groups, or joint work efforts involved in the requirements development process. Most industry input on the supply and demand of critical materials is obtained indirectly. Agriculture, Commerce, and the Bureau of Mines collect information from industry sources, market contacts, and other means and provide it to DOD. Because of apparent conflicts of interests, DOD does not believe that industry should be directly involved in determining requirements for the materials it provides. The DOD-sponsored Institute for Defense Analysis (IDA) obtained much of the information needed for special studies of advanced materials, such as indium and rhodium, through direct industry contacts. These materials were not included in the economic modeling process because their use is limited; thus, they were assessed separately.

DOD appears to generate requirements using a reasonable range of assumptions and options, including those stipulated in the legislation, such as the war scenario; military forces to be mobilized; requirements for the military, industrial, and civilian sectors; available foreign supplies; and domestic production. DOD also factored in a warning and mobilization periods. Under an alternative option, DOD computed a stockpile requirement worth $1.3 billion using a scenario that assumed a 1-year mobilization period and a 3-month war.

DOD also performed sensitivity analyses by changing factors on supplier reliability, shipping losses, pricing, mobilization year shortfalls, plant capacity, and civilian austerity. The results of

these analyses ranged from $2.9 billion to $3.8 billion. No sensitivity analysis was presented for material consumption ratios in the 1992 report.

Regarding fair presentation of participants' input, the final report may incorporate civil agency views in that it reflects the administration's position to the Congress; however, it does not contain dissenting or critical views, as we had recommended.

With respect to verification of economic models, we were told that IDA does "reality checks" of selected strategic and critical materials by obtaining as much input as possible for the more difficult analyses. IDA stated that it consults with the military services, the Defense Logistics Agency, the Defense Science Board, the Defense Advanced Research Projects Agency, and other experts in the private sector. Direct measures of demand and supply for stockpile materials are not readily available. For demand and supply information IDA relies on experts in federal civil agencies responsible for industrial and economic activities.

DOD officials agreed that assumptions and planning factors consistent with related programs should be applied, but they expressed reservations about using stockpile study assumptions and methodology for mobilization planning other than for the stockpile. The Departments of Commerce and State use a peacetime scenario to project lead times for adding new plant facilities and increasing production. Under a wartime scenario, DOD assumes that production will increase dramatically when new plants come on line more quickly, thus creating greater demand for strategic and critical materials.

We noted that the Department of Transportation and other agencies work with FEMA in developing factors associated with industrial base planning and a graduated mobilization response (GMR). According to Transportation officials, many of the planning assumptions that apply to warning times, civil GMR programs, civil industrial capabilities, and cost and construction factors appear to be based on different assumptions from those DOD used in its requirements report. DOD said that the fact that FEMA may use some different planning assumptions for its generic GMR and mobilization planning is not relevant to those aspects of the stockpile program that are determined by military intelligence estimates or statutory mandates.

PARTICIPATION OF FEDERAL AGENCIES AND OTHER EXPERTS

Civilian federal agencies have generally participated in stockpile management and the requirements determination process on an informal, ad hoc basis. The Strategic and Critical Materials Stock Piling Act authorizes the establishment of an advisory group, composed of government agency experts that are also responsible for

emergency mobilization planning under Executive Order 12656, to help determine stockpile requirements and manage acquisitions and disposals. Although such a group may be convened when needed, none has been formally established. Agencies such as Commerce, Interior, and State provide important input to the stockpile process but not in a coordinated, formal fashion. DOD is taking steps to establish such a group or committee and has developed a charter that spells out specific responsibilities of the Departments of Commerce, Interior, and State in advising DOD and providing data for the setting of stockpile requirements. However, DOD indicated that it would not assign responsibilities to civilian agencies that go beyond advisory. DOD said that the charter will include advisory participation in acquisition and disposal actions such as in the area of market impacts, but not in areas under the purview of warranted DOD contracting officers. Final development and approval of the charter is pending.

Officials at the Departments of Commerce and State and FEMA expressed concern about the diminished role of the Market Impact Committee. This Committee, composed of representatives from the Departments of Commerce, State, and Treasury; the Bureau of Mines; and FEMA, is primarily concerned with ensuring that government purchases and sales of strategic and critical materials do not disrupt market prices. It also serves as a forum for assessing industry complaints and concerns. When DOD became responsible for the stockpile, the Committee ceased to function on a regular basis. Although it meets occasionally on an ad hoc basis, there is no consensus arrangement or process for resolving differing views. Agency officials commented that the Committee has been virtually nonfunctional for the past 2 years and that DOD apparently has little interest in the Committee or its views. DOD told Committee representatives they could comment on the annual materials plan but their advice would not necessarily be followed. Under FEMA, the Committee had been an important adviser on the development and execution of the plan.

The DOD Inspector General also concluded in July 1991 that since the transfer of the stockpile from FEMA to DOD, the Committee had not consistently met to review the effects of proposed acquisitions and disposal on domestic and foreign markets. Rather, the Committee assists DOD when requested. FEMA and State have suggested that the Committee be institutionalized. This could be done either through legislation or by an executive order. Formalizing the Committee would provide DOD with informed opinions on how proposed disposal of commodities from the stockpile would affect the marketplace. It would also ensure that Committee members have a clearer understanding of their roles and what is expected of them.

Planning assumptions are fundamental factors in determining stockpile goals. In September 1991, DOD asked 10 civilian agencies to comment on the 23 planning assumptions used to compute stockpile

requirements, including attrition rates, shipping losses, supplier country reliability, civilian austerity measures, and force structure. While several agencies had no comments, the general reaction seemed to be that the assumptions were suitable--given the planning and reporting requirements stipulated in the existing legislation. Some changes were made as a result of comments received. For example, FEMA questioned the projected expansion of capacity for seven industries within a year. DOD said that such an expansion, occurring over a longer period of time, would not be overly ambitious. On the basis of an updated computer analysis and the use of a longer lead time, DOD reduced the number of capacity expansions to five for its 1992 report.

The Departments of Transportation and Treasury and FEMA provided detailed comments. Some of the comments took issue with the wartime scenario and the use of old data. FEMA expressed reservations on 12 assumptions, including those concerning trade conditions, assured suppliers, minerals capacity expansion, the use of a peacetime macroeconomic forecast, and wartime production assumptions. DOD believed that FEMA's criticisms resulted from misunderstandings and misinterpretations of the assumptions. FEMA officials told us that while they had taken issue with technical aspects of several assumptions, they considered DOD to have been responsive to their comments and concerns.

In January 1992, the Office of Management and Budget (OMB) circulated the draft report to 12 civilian agencies for comment. Receipt and disposition of comments were controlled by OMB. Citing confidentiality and a process that tries to encourage candor and straightforward dialogue among the agencies, OMB declined to provide us with specific agency comments or their disposition.

Officials at several agencies indicated that personnel at the program or expert level did not have an opportunity to review and comment on the 1992 report. We were told that policy level comments were handled by the agencies' general counsels. OMB indicated that only two agencies, the Departments of Commerce and the Interior, provided any substantive comments on the report. Officials from Interior's Bureau of Mines did not concur in DOD's draft report. They said that the updating of goals and specifications was long overdue, but it could not accept the present DOD calculations without a better understanding of the basic classified parameters, procedures, methodologies, models, requirements, and assumptions that went into the published results. We have not yet received Commerce's comments.

According to OMB, the final report takes into account comments received from the agencies. However, the report does not set forth separate agency views, whether they are positive or critical. We recommended, in our May 1987 report, that participants' inputs be fairly presented and that any major dissenting views be clearly reported.

- - - -

Mr. Chairman, that concludes my prepared testimony. We would be happy to respond to questions that you may have.

(398091)