

March 12, 1992

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FROM: HUGH D. HAMES

SUBJECT: BERYLLIUM SUPPLY TO THE GOVERNMENT

Info Copy: Astle, Kaczynski, Parsonage, Ryczak, Zenczak

This memo discusses the problem of assuring an ongoing environmentally-sound beryllium supply to our customer base, primarily the Government, while maintaining acceptable margins. Absent growth in AlBeMet, the decreasing metallic beryllium market, coupled with increasing EMS surveillance, defines a potential going out of business curve. This memo summarizes the current situation, reviews Government beryllium activities, discusses the competitive situation, offers a list of options available to us, and identifies several decisions to be made.

Situation Analysis

A recent analysis of the 3-year forecast indicated a \$15-\$20 million base for metallic beryllium exclusive of AlBeMet, BeO powder, R&D activities, and stockpile sales. Furthermore, there are no major systems in sight which are major volume users, even though some of the planned systems upgrades will be done on a prototype basis. Many of the future opportunities involve near-net shape processing which still has high engineering content with its attendant financial risk. Growth in AlBeMet, which appears likely, will mainly impact volume only through melting and casting.

The large amount of scrap available will put additional downward pressure on manufacturing volume.

Environmental, health, and safety pressures continue to increase. Despite significant investment in metallic beryllium manufacturing at Elmore, not all of the processes are capable of operating within a 2 -gm/m³ standard. Increasing CBD is causing fresh doubt about the efficacy of the 1 -gm standard; DOE facilities are in the process of reducing the standard to 1 -gm. I don't need to repeat the long list of environmental challenges which we face.

In short, without growth in AlBeMet, the shrinking beryllium volumes coupled with increased surveillance puts the profitability of the metal business in jeopardy.

BF 0011455

3/15/92 cc: KACZYNSKI
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Current Government Activities

My memo of March 2 summarizes the 1993 Annual Materials Plan (AMP) for the National Defense Stockpile (NDS). Based on past experience, it appears highly unlikely that Congress will give DOD all they requesting. Therefore, the most likely scenario is that a modest amount of upgrading of beryllium will continue while R&D funds will become available. The proposed long-range goals of DOD (5-10 years) will maintain metallic beryllium at current levels while reducing beryllium and master to 0, but their 3-year plan maintains current levels for all types.

The Beryllium Coordinating Committee (BCC) after nearly 4 years of inactivity recently made a presentation to John Todaro, Director of the Production Base Directorate, Office of Deputy Undersecretary of Defense for Production and Logistics. The BCC analyzed the situation pretty much as I summarized above. They tied their analysis back to the National Materials Advisory Board (NMAB) report entitled, "Beryllium Metal Supply Option", published in April, 1988. Their findings, based on the NMAB Report, were:

1. "BNI has made significant progress..... This work should be further encouraged.
2. "Gas atomizing should displace current beryllium powder production methods.
3. "Near net shape processing technology should be further advanced.....
4. "Health monitoring techniques must be advanced and worker exposure further minimized to assure compliance with OSHA standards and to minimize possible future liability.
5. "A Beryllium Technology Consortium (BTC) should be established..... to ensure the supply of beryllium by advancing the technology..... utilize government laboratories....in close concert with industry and contractor expertise.

As a added issue the committee observed that "beryllium metal requirements, though critical, will probably continue to decrease over the next several years. This may result in an unreasonable demand on BNI to continue in what may become an uneconomic production environment. An objective of the BTC will be to expand non-governmental uses of beryllium and beryllium rich alloys thereby assuring a greater market and continued metal availability."

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Along these lines, the government has already put seed money into the development of Aluminum-Beryllium alloys through Gil London's program. (Gil is one of the prime movers on the BCC.)

Also, Loral-AEC has identified a commercial satellite application for precision-machined beryllium components, if they could be made available at lower prices. This is a potential major commercial application and could provide the impetus for the BCC. It would also ensure the preservation of another critical part of the beryllium industry, i.e. precision machining.

Competitive Situation

While direct competition with Brush for the beryllium market is not strong, it has the major effect of diluting the available resources.

On the commercial side, we have competition from MNI and Manufacturing Sciences/British Nuclear Fuels. Primarily, they are competing for development funds and emerging applications.

On the government side, we will have competition for resources primarily from Y-12 and Los Alamos. While it is unlikely that they will ever be facilitated to produce beryllium, they will push hard to become a pilot alternative production facility. This would have the effect of concentrating the advance technology into the Government facility rather than in the industry.

The Uiba Metallurgical Works in the former Soviet Union is a qualified threat. We will know more about their capability after our visit in June.

Our main threat still comes from alternative materials, ironically developed at major Government expense.

Options Available to Brush

Our first option is to go it alone. We would continue incremental improvement of existing processes, but it is unlikely that we could justify major capital improvement. We would continue to compete for R&D funding and we would partner with other manufacturers on an application by application basis. We might consider an arrangement with Uiba Metallurgical as a supplier of basic products.

Our second option is to build on the first by working with the Government to influence R&D funds, Title III money, or manufacturing improvement funds. (This is essentially the strategy pursued in the late 1980's, but appear less attractive at today's business levels.)

Our third option is to become a full partner in the BCC with the primary objective to complete the changes in the manufacturing process. The R&D would be done jointly with Government labs and the inplant demonstration done in existing facilities. In this way, we could accomplish the up-grade of our manufacturing capability, essentially at Government expense.

Our last option would be to conclude that metallic beryllium is no longer an attractive business for Brush. Following this line, we could arrange a sale of assets to the Government and then possibly operate the facility on a GOCO basis.

Decisions to be Made

The list of decisions to be considered are as follows:

1. Which path should we follow for development of our beryllium manufacturing system -- slow incremental improvement of the existing processes or conversion to a process based on near net shape processing of atomized powder?
2. How much Government involvement ^{do} we want in our business -- do we continue as we are (cooperative, but at an arms length) or do we become a full member of the BCC?
3. How do we view profitability in the metal business -- if the government shares the risk, we will not be able to support our current margins.
4. Should we team preferentially with a single precision machining house in light of the direction our business is going?

I'm sure that there are additional questions to be answered. I look forward to discussing these issues on March 17.

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