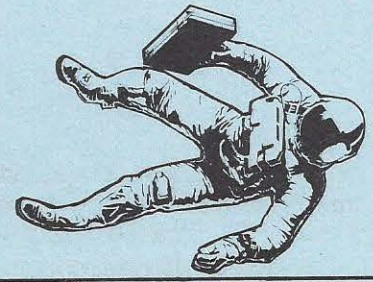
THE FOUNDATION
# COMMERCIAL SPACE REPORT



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Dear Subscriber: May

This month's Report is a special guest commentary by Arthur M. Dula, Attorney at Law. Mr. Dula is a well known expert on Space law and the business aspects of space industrialization. He recently performed a study of reasons why private sector involvement in NASA's materials processing program is weak.

Sincerely,

Gary C. Hudson

Recently I was given the task to identify the ten most important inhibitors affecting the potential commercial materials processors/NASA business relationship. "Inhibitors" means real or perceived constraints that hinder or prevent nonaerospace industry from contracting to use NASA's materials processing capabilities.

## Inhibitors

(1) There is no obvious mandate from within NASA to promote commercial materials processing by nonaerospace industry on the STS (Space Transportation System).

(2) Nonaerospace industries are generally unaware that there is any opportunity for them to participate in space materials processing on the STS.

(3) Nonaerospace industrial research and development managers and business planners are not aware of how space materials processing on the STS can address their specific research missions.

(4) The cost of doing industrial research and development on the STS is so high and uncertain it cannot be authorized through established commercial research and development management channels.

(5) The business liabilities of contracting with the government, through NASA, outweigh the perceived benefits to be derived from using the STS.

(6) Nonaerospace industry does not know how to do business with NASA.

(7) Investment in STS based research and production does not meet existing commercial "risk of failure" standards.

(8) There is a substantial uncertainty over what, if any, patent and data rights can definitely be retained by nonaerospace industrial users of the STS.

(9) The liability faced by a nonaerospace industrial user of the STS cannot be accurately assessed.

(10) Nonaerospace industry does not at present have the experience, personnel or equipment to do STS research, development or production.

In 1976 a study I conducted showed that only about half the Fortune 500 companies interested enough to respond to my questionnaire knew that NASA made any effort to identify space profit centers and involve industry in them. Recent analysis of the raw data from this survey indicates that those companies who knew about possible space profit centers were very much more likely to be planning to do business on the Shuttle.

Since 1976 a few aerospace contractors, Lockheed, TRW, General Electric, Boeing, Rockwell, etc., have been conducting programs of recognition advertising in professional and popular magazines. This advertising has undoubtedly increased business awareness that the Shuttle exists. It is my opinion that this type of advertising is useful, but does not specifically address industry needs. Thus many nonaerospace industries are still unaware that there is an opportunity for THEM, as opposed to industry in general, to participate in materials processing on the STS.

The business planners and marketing analysts I have contacted among my clients tell me that space materials processing is "new-new", i.e. it is a new service in a new market. As such, traditional business wisdom teaches that it must be subsidized to achieve market penetration. A good rule of thumb is that a new product in a new market requires a marketing budget at least equal to and often larger than its development budget.

NASA has done numerous studies of candidate materials processing tasks, e.g. the GE business uses of space study. Some of these have been done in detail, e.g. McDonnell Douglas' study of an automated silicon ribbon plant. Unfortunately this information has not been communicated to all appropriate potential users. Further, despite these ground-based studies, most of the commercial uses of materials processing in space will not be discovered until new and unforseen (from the ground) results are obtained from space research.

This is a two-part problem, concept and communications. Conceptually NASA discusses the Shuttle in terms of its capabilities and industry planners think in terms of rather specific research goals. Only by accident do these two frames of reference overlap. Every industry R&D executive I have contacted is much, much more interested in applied research (usually very specific research applied to particular problems) than in research per se.

Further, investments in STS based research and production does not meet existing commercial "risk of failure" standards.

This is a corollary to the high and uncertain costs of doing materials processing on the Shuttle. It is also a corollary of the fact that nonaerospace industrial research and development managers don't appreciate how materials on the STS can address specific research needs. It is finally a corollary of the fact that not enough economic studies of STS based space fabrication have been done to complement the technical studies describing processess that can be accomplished on the STS.

In order to attract private capital, any materials processing program that produces a product must meet certain rather firm industrial guidelines concerning the capital required to start the process, the return on investment, the length of time required to break even, and the total estimated market for the product. Only a very few space materials processing applications have been studied to the depth necessary to answer these paramount business questions, e.g. McDonnell Douglas' space silicon ribbon study.

## Suggestions

An effort should be made to determine what specific R&D problems are currently faced by the top 1,000 American industries without regard to whether these problems are obvious candidates for the STS. This will be difficult because these problems are oftem sensitive trade secrets. NASA should then organize all past materials processing data into categories by industry problem areas and pay "sales calls" on those R&D managers who could possibly use STS capabilities in its R&D.

NASA management must become aware of the difference between the academic aerospace world view and the pragmatic reality faced by nonaerospace R&D managers and business planners. This can be accomplished by:

(1) Asking nonaerospace R&D managers and business planners for suggestions on how to structure the space materials processing program. This should be done both through professional societies and by direct NASA management contact.

(2) Having aerospace contractors and aerospace professional societies ask for these suggestions and act as a buffer between NASA and the nonaerospace user community.

(3) Large amounts of personal contact between NASA planners and business planners at executive management levels.

(4) Willingness on the part of NASA to involve all nonaerospace industry in this dialogue, not just large industry or those groups NASA presumes may be interested.

(5) NASA should adopt an attitude of staying as far out of its commercial partner's business affairs as it can.

(6) NASA should make it a point to be extremely easy and flexible to work with regarding contracting for materials processing research and development on the STS.

(7) Nonaerospace industry should be teamed with aerospace industry wherever possible to give the nonaerospace managers exposure to government contracting and business procedures.

I have drawn the following conclusions from the recent testimony of high NASA officials:

(1) NASA would like nonaerospace industry to use the materials processing capabilities of the STS to produce space-fabricated products that can be marketed on earth.

(2) NASA feels the way to accomplish (1) is to encourage industry to do R&D on the STS.

It is my opinion that most nonaerospace industry does only highly goal directed R&D at the funding levels required for STS operations. Thus NASA's encouragement of commercial R&D does not promote commercial materials processing by nonaerospace industry on the STS.

Nonaerospace industry does not at present have the experience, personnel or equipment to do STS research, development or production.

This is included as a problem because it must be addressed in the near future. It would be more accurate to state that this is a sympton caused by the other problems. In fact, nonaerospace industry knows virtually nothing about the Shuttle and therefore it could not be expected to have the experience, personnel or equipment to do STS materials processing research. If the problems listed are cured, this one will disappear naturally.

Sincerely,

Arthur M. Dula

Editors Note: Due to the length of this months feature article, News Notes have not been included in this issue.

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