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THE  
A·B·C's  
OF  
IR & ID

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(A Primer)

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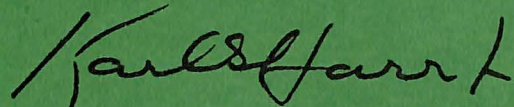
## PREFACE

As is often the case, things first mentioned casually in conversation do eventually come into being. So it is with this little booklet.

A few years ago, members of our staff were deploring the fact that, despite reams of information available regarding the Independent Research and Development (IR&D) activities of contractors to the government, reports persisted that many people who should understand IR&D either claimed or demonstrated that they did not.

Someone floated the idea of reducing the essential facts about IR&D to a primer. The idea didn't catch on at the time. In subsequent years through 1975, additional reams of information on IR&D were developed within the Congress, various agencies of government and by industry. Yet lack of understanding of IR&D is still much in evidence.

"Why not try a primer, the ABC's of IR&D?", someone asked again. And then he sat down and wrote one.



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# A

... is for the **Activities** independently initiated and funded by business and industry in research and development devoted to advancing company technology and techniques, improving current products and processes or looking for new ones.

# B

... is for **Business Expense**, a common term in private enterprise. It is accepted practice for companies to treat their expenditures for research and development (R&D) as a business expense and to recover those costs from their sales. For example, an automotive R&D expense at General Motors for use in future cars will be recovered in the price of GM cars this year.

# C

... is for **Contracts**. Many companies accept contracts to do R&D work for others, particularly the government. Government agencies, the Department of Defense (DOD), for example, contracts extensively with industry for specific R&D. In addition, DOD recognizes that its contractors generally do self-initiated and self-funded R&D, and it terms this activity "Independent" R&D or IR&D. Within the framework of a succession of statutes and regulations, DOD and other federal agencies permit contractors to recover a portion of their IR&D costs in the pricing of the sales they make to the agencies.

# D

... is for the **DOD Military Procurement Authorization Act** of 1971 (Public Law 91-441, Section 203) which presently governs how contractors may recover their IR&D/B&P costs from the DOD. B&P represents Bid and Proposal costs. Two of the statute's important features are that DOD must negotiate an annual Advance Agreement establishing a dollar ceiling with all contractors who in the

preceding year received more than \$2 million of IR&D or B&P cost allowability from DOD and that only those company IR&D/B&P costs having a potential relationship to a military function or operation are allowable.

**E** . . . is for the **Effectiveness** which American industry has demonstrated in science and technology. This has been widely credited for our economic growth and improved standard of living, and, in addition, U.S. technology-intensive products have made outstanding contributions to our balance of trade. This performance in great measure can be credited to the independent and competitive in-house technical efforts initiated and managed by U.S. corporations.

**F** . . . is for the **False Claims** by a handful of vocal critics that the IR&D conducted by industrial contractors to DOD does not represent a normal, recoverable business expense but rather a "billion dollar boondoggle." However, study of this issue shows that the national benefits from IR&D are substantial. More convincing is the fact that IR&D costs have been endorsed as logical business expenses by the Commission on Government Procurement, the General Accounting Office, the Office of Federal Procurement Policy, a panel of the Defense Science Board, the Department of Defense, the National Aeronautics and Space Administration, and many other witnesses before Congressional hearings, including representatives of small business.

**G** . . . is for **Getting at the Facts** to the effect that (1) IR&D is not a Government Program but a traditional American business practice which has apparently come under fire only because many major, high-technology companies conducting IR&D are contractors to the Department of Defense, a favorite target for criticism, (2) annual IR&D expenses recovered by all DOD contractors operating

under Advance Agreements are currently *not* \$1 billion but about \$400 million, (3) while some in Congress claim that the IR&D program has no Congressional "visibility" and that the legislative branch has no control over it, actually the Department of Defense exercises extensive control and reports regularly to the Congress on IR&D *and* B&P.

**H**... is for **Hearings**, extensive in nature in 1970 and again in 1975, that have been held on IR&D. Study of the record of these hearings should establish beyond a reasonable doubt that IR&D is a company-initiated exploratory effort not directed toward any specific customer requirement of the moment but rather toward advancement of technology in those areas that each company believes will be of potential customer interest in the future; that neither IR&D or B&P are programs offered for sale; that, instead, DOD and other customers buy goods and services which contain a proportionate allocable share of all of a contractor's indirect costs including a portion of IR&D/B&P costs.

**I**... is for **Independent**, which is the key word in distinguishing the nature and value of IR&D. It is curious that there are those in government who wish to make industry's own efforts, own initiatives in research and development *dependent* upon government decisions. It comes down to the question of whether government should permit industry to make decisions that are, in fact, the most significant management must make as to the future of the enterprise. Clearly, defense-oriented firms should be as free to decide what research and development avenues should be pursued as are commercially-oriented firms.

**J**... is for **Judgment**, a key element employed by industry in determining the most promising research to conduct. That judgment is also applied by industrial managements to discontinue research the moment evidence appears that a given av-

enue looks unpromising. There is no basis for believing that agencies or branches of the government can make better or quicker judgments as to what industrial research efforts to initiate or when to do so.

**K** . . . is for **Knowledgeable Competition**. The fact that IR&D produces knowledgeable contractors to compete for government business is considered by many government officials and members of the Congress as the primary value of IR&D. When a government agency issues a Request for Proposal on some complex product or system it is seeking a highly competent, experienced contractor who can be counted on to perform in an exemplary manner and succeed in meeting every technical challenge. It is the companies that have been very imaginative and aggressive in wisely pursuing prior IR&D efforts in appropriate technical areas that are best qualified to compete. Similarly, IR&D devoted to finding more cost-effective solutions to problems stimulates the cost competitiveness among potential contractors—again, a factor critical to government agencies.

**L** . . . is for **Line Item**, which is a complex concept of IR&D and B&P put forth in debate on these issues. While the concept is complex, it sounds simple: just put the costs for IR&D and B&P as a line item in the annual federal budget. The purpose of a budget line item in the federal budget for industrial overhead costs like IR&D and B&P has been stated as necessary to give Congress control over these costs. This concept is unworkable. Can you imagine Congress, in seeking budget justification for IR&D, reviewing 10,000 contractor IR&D programs which under Public Law 91-441 are already under very tight control by DOD through advance agreements, audit reviews, technical evaluations, potential military relationship tests and tests as to reasonableness and allocability?

**M** . . . is for **Management**, that function within private industry that is responsible for and best equipped to make decisions as to what research and development activities each company will engage in. If a company spends too much, it becomes non-competitive in its prices. If it spends too little, it becomes noncompetitive in its capability. Management must therefore make prudent and knowledgeable judgments on R&D and assure that R&D costs are recovered in the sales of the company. If it is not possible to recover an equitable portion of those costs in sales to the government, then sooner or later management must decide whether or not to devote stockholders' resources to business with the government.

**N** . . . is for the **National Interest**, which is directly related to whether science and technology, including the independent innovative efforts of industry, is to be encouraged or discouraged in the United States. Opposition to IR&D from a few critics comes at a time when there is substantial and increasing concern that the continuing erosion in R&D activity in the U.S. must be turned around. As a recent Congressional Research Service report prepared for a House Subcommittee on Science, Research and Technology states: "Financial incentives to industry for research and development and scale-up costs are common in most countries. Mechanisms include tax credits, elimination of sales taxes on specific products and services, accelerated depreciation allowances, low-interest loans, and also outside grants for the direct support of research and development." The report indicates that some countries—France, Canada, Japan and the United Kingdom—have gone so far as to set up research and development corporations. All that U.S. government contractors ask is that the costs of their own R&D efforts be recoverable in the prices of their products so they can continue to contribute significantly to our nation's technical excellence in defense, transportation, space, energy and other technologically-intensive endeavors.

O

... is for an **Office of Science and Technology**, a function within the White House abandoned in 1973 along with the National Aeronautics and Space Council and the President's Science Advisory Committee. Reinstatement of some central focal point for national policy and thrust in science and technology is currently under consideration by the Congress and the Executive Branch. Perhaps out of such action there will emerge clearer recognition by government that without a preeminent world position in high technology applied to energy systems, transportation, space and defense we will be unable to sustain a standard of living or security comparable to that we currently enjoy.

P

... is for **Potential Military Relationship**, a requirement in Public Law 91-441 that IR&D work conducted by DOD contractors must have a potential relationship to a military function or operation for any part of its costs to be chargeable to DOD contracts. This requirement borders on the unrealistic inasmuch as defense-related technology does not exist in isolation but is part of the main stream of knowledge generally described as the "national technology base." Relevancy tests are fundamentally incompatible with the exploratory nature of IR&D and invite hindsight judgments. Who can with certainty judge the relevancy of such efforts in advance of attaining and assessing their end results?

Q

... is for the **Question of Benefits**. "Strengthened competition" and the "competence that results from competition" within the defense industry are seen as the primary benefits of IR&D to the Department of Defense. In its recent posture statement, DOD stated that "competition has been our national tradition and the competence which results from competition is the most important factor in



determining eventual success or failure of any Defense procurement." The statement adds that "beyond the primary benefit of competition, we receive a fringe benefit, or 'fall-out', of a highly productive flow of new technology." For the pragmatists who claim that "nobody can document the benefits of IR&D" industry replies that "critics have not demonstrated interest in studying 220 pages of specific benefits" compiled and disseminated in 1974 by three associations (AIA, EIA and NSIA).

**R**

... is for **Return on Sales (Profits)** and/or Return on Investment Capital, both measures of whether a company or an industry receives a fair return for the business it conducts and the risk it takes. It is cited here only because critics of IR&D like to imply that there are wildly extravagant profits in government work and therefore why not absorb IR&D costs out of profits. Well, taking the aerospace industry for example, profits on sales have ranged from 1.9 percent to 3.0 percent after taxes compared to approximately 4.5 percent for all manufacturing. And studies by the Logistics Management Institute, the General Accounting Office, and *Forbes* magazine have all documented the relatively low return in aerospace and defense. The latest *Forbes* report of 1975, which analyzed the profitability of 30 industry groups, indicated that aerospace and defense, with an 8.8 percent return on total capital employed, ranked 24th of the 30 industries studied.

**S**

... is for **Subsidy**. Critics of IR&D/B&P cite the recovery of these costs by contractors as a subsidy by government. "The notion that IR&D is a subsidy or a giveaway is erroneous," states Dr. Malcolm Currie, Director of Defense Research and Engineering in his 1975 testimony. He then continued: "On the contrary, it actually represents a great bargain to the Government. In 1974 on the average,

92% of all IR&D projects were directly relevant to DOD interests while, on the average, DOD paid only 39% of the cost of the IR&D effort incurred. For this discounted payment, the Government is able to maintain the most advanced technology and innovative systems in the world.”

**T**

... is for **Technology Advancement**, the major thrust of industry's independent technical effort. Industry sponsors IR&D primarily to maintain a competitive capability in key technologies. It should be realized that industry cannot and does not expect government to contract for every activity each company requires to remain competitive. There is a wide misconception that all IR&D is aimed at, and ultimately results in, the design of products suitable for sale to a broad spectrum of customers. To the contrary, IR&D work is directed toward those things—many not identifiable as end products at all—considered vital to the continued pursuit of a given type of business. A given company's IR&D is therefore strongly influenced by the nature of its products, by the needs of its customers, and by its management's perception of the key long-term business opportunities in its field.

**U**

... is for **Understanding** of IR&D and B&P. There are literally mountains of documents and rationale on these matters issuing from the 1970 and 1975 Congressional hearings and the reports by the Commission on Government Procurement, the General Accounting Office, a panel of the Defense Science Board and the comprehensive, 312-page volume of technical papers and 34-page position paper developed in 1974 by three industry associations. All these should satisfy the needs of legislators and policy makers in first understanding and then making a much-needed, firm and long-lasting decision as to an official government posture on IR&D and B&P.

**V** . . . is for **Vitality** on the American technological frontier. The government and the public must make up its mind as to the vigor with which this country pursues research and development, science and technology. The national interest is deeply involved in technological progress. The problems environmental and social—created by or blamed upon technology—can best be solved by technology itself. The disincentives against technology are contrary to the national interest. The constraints against the IR&D and B&P technological efforts of industry are illogical to the extreme. Defense industry admittedly has its faults, nonetheless extends to no one its apologies for its contributions to national defense, to accomplishments in space, and its innovations in technology for the betterment of mankind. These industries believe in technological vitality and place upon the critics of technological endeavor the burden of denying American industry its role in nurturing the strength of the American economy.

**W** . . . is for the **Whipsawing** of industry that has taken place on the IR&D issue. Despite the preponderance of support of IR&D as an accepted and necessary business expense, part of industry's indirect costs and as such appropriately included in product and contract estimates, the attempts of a very few to reduce this effort continues. These are characterized by such press release phrases as "rip-off" and "billion dollar gravy train" which paints the technical endeavors of industry as a subversive plot to plunder the U.S. Treasury. Industry, frankly, is appalled by the apparent acceptance of such unfounded accusations, knowingly or unknowingly, either within government or by certain of the media.

**X** . . . is for **Xerography**, the formation of pictures or copies of graphic matter by the action of light on an electrically charged photoconductive insulating surface in which the latent image is usually developed with powders. How many photo copiers



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