Norm Lokker
fyi
Bob Crawford

SBIR Program Objectives

Conversion of research into technological innovation and commercial application

Requirements of the Act

Under P.L. 97-219, all federal agencies with an extra-mural R&D in excess of $100 million are required to allocate a legislated percentage of that budget (to a maximum of 1.25 percent annually) to fund an Small Business Innovation Research (SBIR) program.

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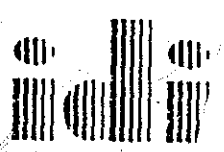


SBIR Program

Participating Federal Agencies

Department of Defense
Health and Human Services
Department of Energy
National Aeronautics and Space Administration
National Science Foundation
Department of Transportation
Department of Agriculture
Nuclear Regulatory Commission
Environmental Protection Agency
Department of Education
Department of Commerce

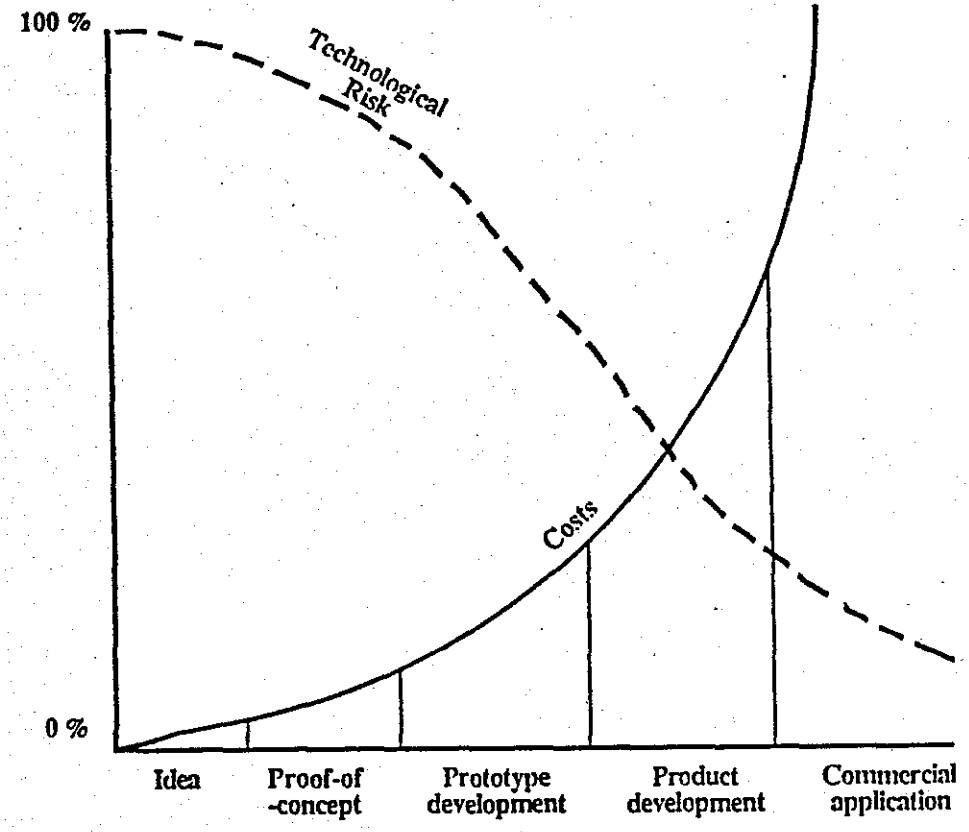
FY 88 By-Agency SBIR Budget Summary (000's)
(estimates by idi)

Agency	Budget commitment	% of Total
DOD	$210,000	58.40
HHS	55,000	15.30
DOE	33,500	9.32
NASA	30,250	8.41
NSF	16,400	4.56
DOT	4,000	1.11
USDA	3,500	0.97
EPA	2,325	0.65
DoEd	1,700	0.47
NRC	1,655	0.46
DOC	1,250	0.35
Total	$359,580	100.00



Innovation Process

Innovation Development Institute



SBIR Program Format

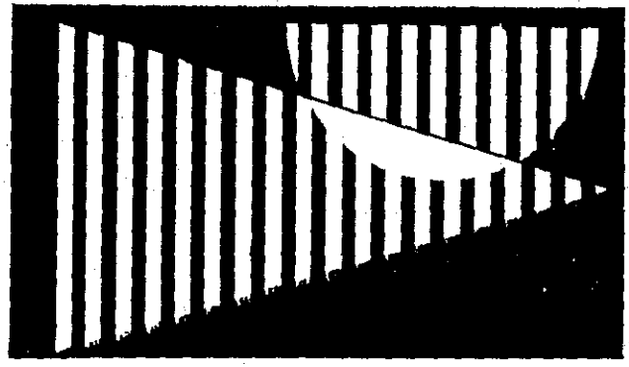
Phase I	FEDERAL DOLLARS	• Scientific and technical feasibility proposal in response to agency research needs open-solicitation • Award dollars - to $50k (more in Defense) • Project duration - six months
Phase II		• Prototype development proposal. • Scientific and technical evaluation criteria • Award dollars - $100k - $500k • Project duration - six months • Private sector commitment and market assessment
Phase III		• Commercial market development using private sector support • Federal application under government procurement contract

Important: Successful completion of Phase I required for Phase II consideration

SBA U.S. Small Business Administration
Office of Innovation, Research and Technology

SBIR Pre-Solicitation Announcement

This issue contains information on the following SBIR Agency Solicitations.



SBIR/PSA

Getting started:

Though structured to the same format, each of the participating agencies has complete administrative responsibility for their SBIR program. **General oversight responsibility** for the program was assigned by Congress to the U.S. Small Business Administration.

Each quarter the SBA issues a **Pre-Solicitation Announcement** indicating

- those solicitations to be issued and/or with due dates during the quarter
- information on the number of awards to be made, the $ amount and the topic titles.
- full list of agency representatives with addresses and phone numbers.

To receive a copy of the Pre-Solicitation Announcement on a regular basis and be placed on the master SBIR/SBA mailing list, contact in writing.

Office of Innovation, Research, and Technology
U.S. Small Business Administration
1441 L Street, NW, Room 500
Washington, DC 20416

SBIR Eligibility

Of the company:

- **organized for profit**
- **not dominant in the field**
- **including all subsiduaries and affiliates, have a total employment of less than 500 persons**

Of the Principal Investigator (P.I.)

At the time of the award (specifically NOT at the time of application), the primary employment of the P.I. must be with the receiving small firm.

Definition: commitment of more than 50 percent of TIME (versus income)

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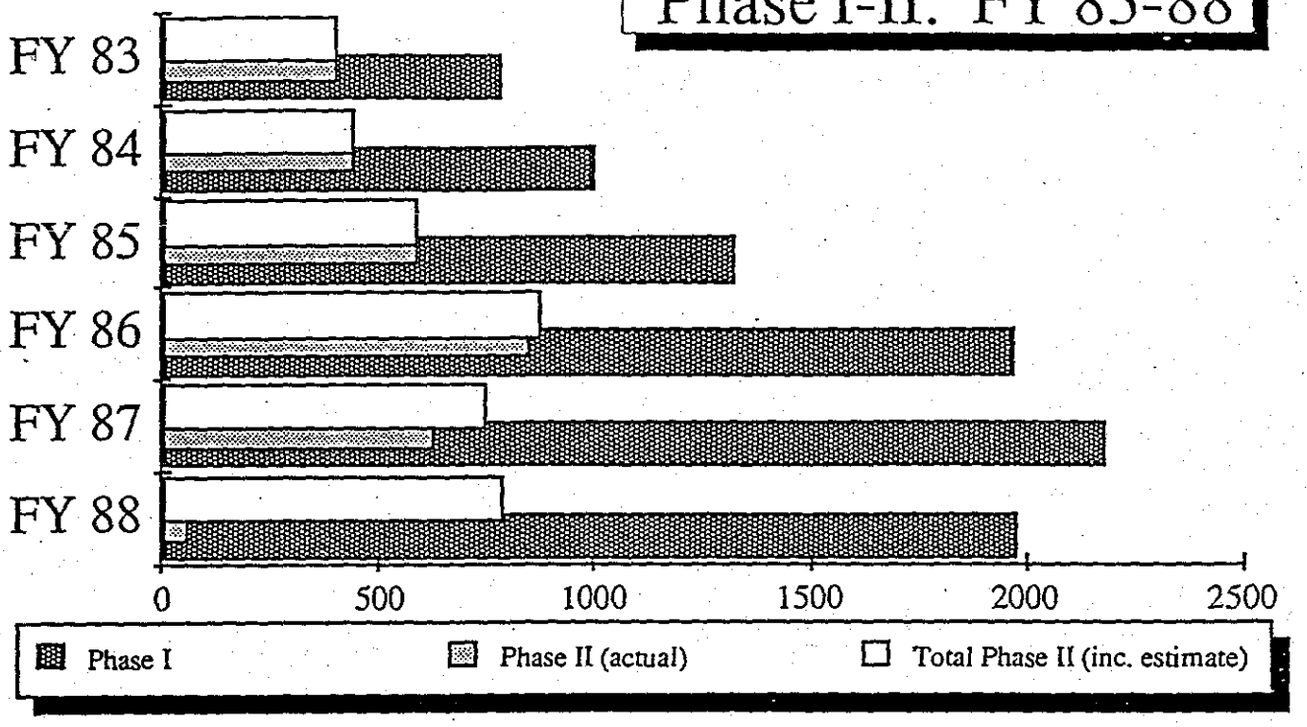
Phase I-II: FY 83-88



Phase I - Phase II Conversion Rates By Agency

Agency	FY 86		FY 85			FY 84			FY 83		
	Phase		Phase		Conv.	Phase		Conv.	Phase		Conv.
	I	II est.	I	II	%	I	II	%	I	II	%
DOD	1017	458	542	245	45.2	369	166	45.0	283	151	53.4
NIH	410	185	432	175	40.5	226	83	36.7	139	75	54.0
NASA	172	75	151	49	32.5	127	72	56.7	102	58	56.9
NSF	151	45	125	30	24.0	105	29	27.6	102	39	38.2
DOE	101	43	110	45	40.9	102	46	45.1	106	51	48.1
DOT	29	10	30	8	26.7	17	6	35.3	6	3	50.0
USDA	31	10	21	10	47.6	16	10	62.5	16	7	43.8
EPA	24	12	19	10	52.6	10	6	60.0	10	5	50.0
DoEd	14	6	13	6	46.2	12	5	41.7	8	3	37.5
NRC	10	6	10	6	60.0	6	4	66.7	7	4	57.1
DOC	10	4	7	3	42.9	-	-	-	-	-	-
DOI	-	-	2	0	0.0	13	1	7.7	6	2	33.3
Totals	1969	854	1462	587	40.2	1003	428	42.7	785	398	50.7

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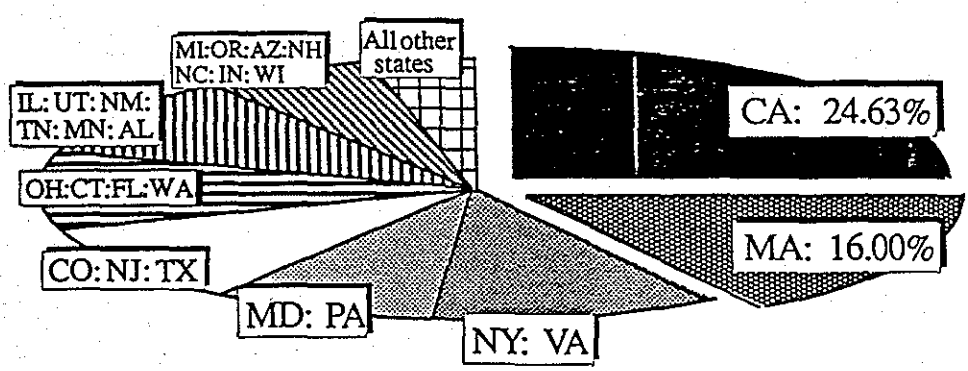
SBIR Phase I Awards FY 87-88
Distribution and Ranking by State
Totals and % of whole

State	FY 88 Ph.I's	FY 88 %	FY87 Ph.I's	State	FY 88 Ph.I's	FY 88 %	FY87 Ph.I's
California	488	24.65	554	Louisiana	10	0.50	9
Massachusetts	317	16.00	305	Georgia	9	0.45	18
New York	106	5.35	89	Missouri	9	0.45	7
Virginia	105	5.30	118	District of Columbia	8	0.40	6
Maryland	93	4.69	131	Hawaii	7	0.35	1
Pennsylvania	71	3.58	87	Oklahoma	6	0.30	15
Colorado	64	3.23	60	Rhode Island	6	0.30	1
New Jersey	64	3.23	51	SthCarolina	5	0.25	1
Texas	64	3.23	65	Iowa	4	0.20	3
Ohio	51	2.57	67	Montana	4	0.20	4
Connecticut	50	2.52	47	Nevada	4	0.20	4
Florida	49	2.47	50	Idaho	3	0.15	1
Washington	46	2.32	56	Vermont	3	0.15	2
Illinois	37	1.87	30	Alaska	2	0.10	0
Utah	36	1.82	49	Arkansas	2	0.10	1
New Mexico	34	1.72	52	Delaware	2	0.10	3
Tennessee	30	1.51	34	Kentucky	2	0.10	2
Minnesota	29	1.46	28	Maine	2	0.10	8
Alabama	27	1.36	41	Mississippi	1	0.05	1
Michigan	22	1.11	41	NorthDakota	1	0.05	1
Oregon	22	1.11	24	PuertoRico	1	0.05	1
Arizona	20	1.01	25	SouthDakota	1	0.05	1
N Hampshire	19	0.96	16	West Virginia	1	0.05	2
NthCarolina	16	0.81	21				
Indiana	14	0.71	12	Totals	1981	100.00	2159
Wisconsin	14	0.71	10				

Distribution by State of FY 88 Phase I SBIR Awards



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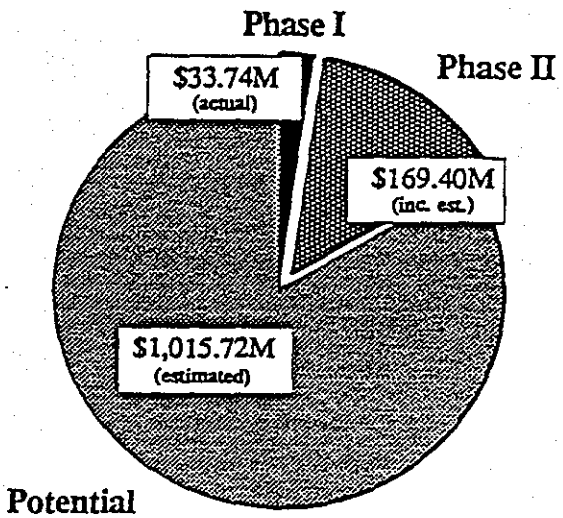
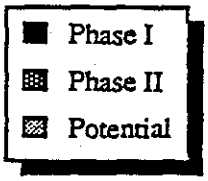
SBIR Leveraging Factor
FY 83 Initiated Projects
(in selected number of states)

State	Phase I Awards	# of firms	Dollar commitment (in millions)[1]	Phase II Awards	# of firms	Dollar commitment (in millions)	Phase III potential[2] (in millions)
Alabama	15	7	$0.72	10	5	$3.50	$21.10
California	166	88	$7.97	112	68	$39.20	$235.84
Colorado	18	7	$0.86	14	5	$4.90	$28.82
Connecticut	19	8	$0.91	12	5	$4.20	$25.56
Florida	11	2	$0.53	10	2	$3.50	$20.14
Illinois	15	5	$0.72	12	4	$4.20	$24.60
Massachusetts	143	73	$6.86	76	47	$26.60	$167.32
Maryland	36	19	$1.73	31	17	$10.85	$62.89
Michigan	15	9	$0.72	12	7	$4.20	$24.60
N.Carolina	18	11	$0.86	13	9	$4.55	$27.07
New Jersey	16	4	$0.77	13	4	$4.55	$26.59
New Mexico	10	6	$0.48	7	5	$2.45	$14.65
New York	25	13	$1.20	22	13	$7.70	$44.50
Ohio	29	16	$1.39	21	14	$7.35	$43.71
Pennsylvania	28	14	$1.34	21	10	$7.35	$43.47
Tennessee	10	5	$0.48	6	4	$2.10	$12.90
Texas	27	5	$1.30	22	5	$7.70	$44.98
Utah	16	7	$0.77	8	5	$2.80	$17.84
Virginia	55	29	$2.64	44	26	$15.40	$90.20
Washington	31	17	$1.49	18	11	$6.30	$38.94
Total	703	345	$33.74	484	266	$169.40	$1,015.72

1. These figures include i d i estimates for those projects for which exact dollar amounts were not available.
2. Calculated by an i d i Phase III estimated leveraging ratio of 5 : 1



FY 83 SBIR Activity
Potential Leveraging of SBIR Award Dollars
(Assuming a 5:1 leveraging ratio)



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P.L. 95-517
Patent and Trademark Act of 1982

Bayh-Dole Amendment

InKnowVation
May 1985
Volume 11 Number 6

Acquiring Patent Rights From Federally Funded Projects

Until 1980, the law required that in any project for which federal dollars were expended, the patent rights to developed technology passed to the federal government. Though in the NSF SBIR program (which preceded the present expanded effort) patent rights were routinely assigned to the participating small firms, in fact the agency was not by law required to make that transference.

Since ownership and protection of the firm's developed intellectual property is at the core of much subsequent business activity - particularly in the small firm - it was vital that prior to passage of the SBIR enabling legislation, that Patent Law be modified.

Under provisions of the Bayh-Dole amendment passed into law in 1980 (P.L. 96-517) small firms (and universities) will ordinarily be able to retain title to inventions first conceived or reduced to practice during performance of work funded by the federal government. The government in these circumstances usually can retain only a royalty free license for internal use.

The required procedures to retain rights to inventions under the law are clearly defined. However, given that failure to follow those procedures can still, in limited circumstances, result in forefeiture of those rights, it is critical that firms involved clearly understand the requirements.

Limitations

Two basic provisions for retention of issued patents also apply and should be noted --

- Under what are called *march-in-rights*, the federal government can require a small firm to license the invention to another firm for development and manufacture. This will apply when it is determined that, in the agency's judgement the technology is needed and, within a reasonable period of time, the small firm which holds title has not proceeded to any use of its invention.

Before exercising the march-in-rights activiated by failure to meet the public use requirement set by federal regulations, the agency must follow procedures which permit the firm involved to present its case. If the firm is not able to persuade the agency that it should retain exclusive rights, some or all those rights can be licensed to the firm which has challenged their retention.

- In most cases, there is a prohibition against the granting of an exclusive license to the patented invention to a firm that will not substantially manufacture in the United States the product(s) which incorporates that invention.

To date, what constitutes 'substantially manufactured' in the United States has not been defined nor tested. Since foreign manufacture may sometimes be the economically perferable option, the award of the march-in-rights under this *domestic preference rule* is potentially a serious threat.

If it is essential that manufacture of licensed products not take place in the U.S., the firm must be able to obtain a waiver on the domestic preference rule. To do this, the firm must persuade the agency that efforts to license to firms which will manufacture in the U.S have been unsuccessful and/or that domestic manufacture is not commercially feasible.

Requirements to retain title

1. Disclosure to the SBIR agency

The patent rights clause of SBIR award documents require that within two months after the inventor discloses in writing to the employing small firm any invention with patent potential developed under that award, that the firm then disclose that information in writing to the SBIR agency involved. Extensions beyond two months - if necessary, for example

to prepare a technically complete description of the invention - are available from the agency.

Though failure to comply with this rule will not always result in loss of patent rights, to safeguard those rights SBIR firms should comply with this requirement.

Both of these procedures may seem unnecessarily burdensome. However, they can subsequently be useful in verifying that right of the firm to retain title.

The requirement for written notification of the agency does not exist until the firm has received written disclosure by the inventor. Essentially, that first formal act sets the clock running for the firm's disclosure to the agency and gives clear proof of the required disclosure. It is good practice in the firm, therefore, to establish as the written policy of the firm that principal investigators and technical personnel associated to funded projects give prompt notice to management of patentable inventions.

The disclosure to the agency must indicate if the invention has been sold or used publicly, or if any article describing the invention has been submitted to a publisher or accepted for publication. Disclosure of these events is important since either, or both, shorten to one year the period during which valid patent protection can still be obtained in the United States.

2. Elect to retain title

To preserve full rights to an invention, within twelve months of disclosure to the firm by the inventor (as above), the small firm should elect in writing to retain the title. Note that this twelve months begins with the first formal, written act of disclosure by the inventor, not the firm's disclosure to the agency which can take place, as noted, two months or more later. As in (1), however, an extention on this deadline can be requested.

Whenever the statutory period for patent protection has been shortened by publication of the invention, the SBIR agency may also shorten this election period. In these cases, the agency has the option to notify the firm that its election period will end on a specific day within the 60-day period prior to the end of the statutory protection period. Unless the agency notifies the firm in writing of this condition, then it does not apply.

3. File patent application

Within two years of the written election to retain title, the final step to preservation of rights to the invention is the filing of a U.S. patent application. As noted above, where publication or other public disclosure of the invention has triggered the one-year patent protection period, the two-year period, for filing of patent application is automatically shortened, i.e. to preserve patent rights, the firm must file U.S. application within the one-year patent protection period.

Application for foreign patents should ordinarily be made within ten months of the corresponding U.S. patent filing.

Consequences Non-Compliance

Failure to disclose an invention, to make election to retain title, or to file patent application within the statutory time periods does to the agency. However, it does cede to the agency the discretion to require that patent rights transfer at a later date.

By far the most serious omission is that of failure to disclose. If this is not done and, in consequence, the agency chooses to take the rights, the firm loses everything not even retaining a non-exclusive, royalty-free license.

The consequences of failure to make election to retain title, or to file patent application are less drastic in that, though the firm loses exclusive rights, it retains a non-exclusive, royalty-free license. However, though these are important retained rights, the loss of exclusivity may be very serious. Investors, for example, are far less willing to back product to which others also have rights. The IRS requires that in an R&D Limited Partnership, patent rights involved, and the capacity of the firm to engage in any form of technology transfer to achieve income generation is greatly limited.

Selected Costs Under 41 CRF 1-15.205

Costs	Allowable Direct	Allowable Indirect	Non Allowable
Advertising			
- contract related recruitment	x		
- specialized procurement or disposal		x	
- promotional			x
Bad debts			x
Bidding costs		x	
Bonding costs	x		
Civil defense costs		x	
Compensation			
- Salaries and wages	x	x	
- Cash bonuses and incentives (planning)	x	x	
- Bonuses and incentives paid in stock	x	x	
- Stock options			x
- Deferred compensation (planning)	x	x	
- Fringe benefits	x		
Contingencies			x
Contributions			x
Cost of money			
- facilities		x	
- of capital assets under construction		x	
Depreciation		x	
Dividends			x
Economic planning costs		x	
Employee morale - health, welfare, food service, dorm.costs and credits		x	
Entertainment costs			x
Facilities not in use			
- facilities			x
- capacity		x	
Fines and penalties			x
Gains and losses on disposition of property		x	
Insurance/indemnification			
- Casualty		x	
- Life			x
- Self insurance			x
Interest			x
Labor relations costs		x	
Lobby costs			x
Losses on other contracts			x
Maintenance and repair		x	
Manufacturing/ production engineering costs		x	
Material costs		x	
Organization costs			x
Page charges in scientific journals	x		
Patents	x		
Plant protection costs		x	
Precontract costs	x		
Preservation of records		x	
Professional/consultant service costs		x	
Rental costs	x		
R&D costs		x	
Royalties		x	
Selling costs		x	
Service/ warrenty costs	x		
Severance pay (planning)	x		
Special tooling and test equipment costs		x	
Taxes		x	
Termination costs	x		
Trade, business, technical & professional activity costs		x	
Training/ education costs		x	
Transportation costs	x	x	
Travel		x	

Prepared by **Lawrence S. Nannis** CPA, Levine, Zeidman & Daitch, P.C., Chestnut Hill, MA.
Reprinted by request from **InKnowVation**, Vol. I No. 8 (Sept. 1984)

Proposal preparation : a 30 day schedule

(as developed by Robert Wakoff, Bell Aerospace Textron, Buffalo, NY for use by SBIR applicant firms)

SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.
	Pre-Bid • Customer • Innovation • Support →		Kick-Off Meeting Consultants Proposal Leader 30	Prepare Proposal Schedule 29	Prepare Outline & Assignments 28	27
26	25	24	23	Review Status 22	S.O.W. & Schedule 21	20
19	18	Draft inputs to Leader 17	16	15	Draft complete. Illustrations complete. 14	13
Red Team Review 12	Incorporate comments → 11	Cost inputs. 10	Final draft for Publications 9	8	Cost Review. 7	6
5	4	Transmittal complete. Proposal, cost letter. 3	Ship. 2	1	Due at Customer. 0	

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Swampscott, MA

Examining the feasibility of the project

1. State the problem clearly and in a sentence.
2. Identify the primary and the secondary discipline(s) involved.
3. Consider your (and the firm's) special aptitudes for conduct of this particular project.
4. Specify your access to the required data
   - — availability
   - — constaints
5. Consider in some detail the data-gathering methods to be used.
6. Flag potential problem areas with some indication of how they would be dealt with
7. Identify equipment and other resource needs, factoring both to your access and your ability to use such equipment.

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Sample Statement of Work

1. Project Objective

The contractor shall investigate the electrocatalytic production of styrene from ethylbenzene in solid electrolyte fuel cells. The effort is directed toward defining optimal operating conditions for achieving high yields of styrene with simultaneous electric energy generation.

2. Scope of Work

The work to be performed consists of the following tasks:

2.1 Construction of tubular stabilized zirconia fuel cells with a platinum cathode and an iron oxide of platinum anode. Both anode materials are quite promising and a decision between the two will be made after preliminary runs.

2.2 Measurement of the styrene cell activity and yield as a function of velocity, temperature, and inlet concentration of ethylbenzene and external resistive load.

2.3 Measurement of the cell electric power output and overpotential as a function of the operating parameters described in 2.2.

2.4 Preliminary engineering and economic analysis according to the results of 2.2 and 2.3.

2.5 Final Report preparation.

3. Performance Schedule

Task 2.1 completed two months after start of work.

Task 2.2 and 2.3 completed four months after start of work.

Task 2.4 completed five months after start of work.

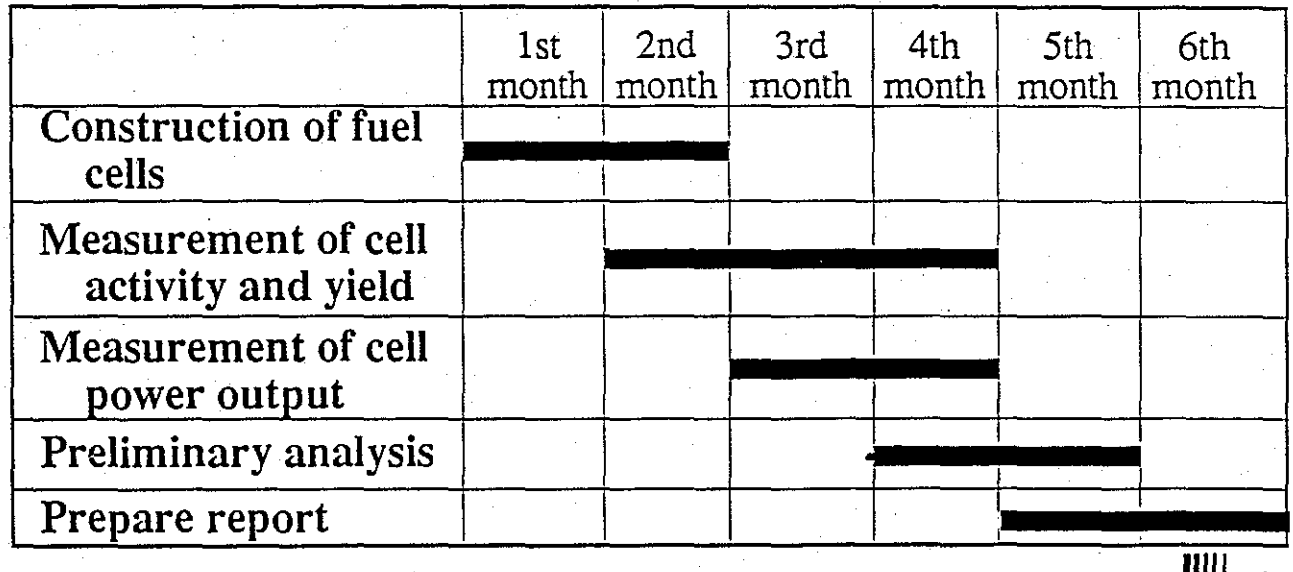
Task 2.5 completed six months after start of work.

4. Deliverable

The contractor shall provide a Final Report containing the data from the experiments performed according to Tasks 2.2 and 2.3, along with analyses and conclusions based on this data.

From U.S Nuclear Regulatory Commision FY 83 SBIR Solicitation

Work Schedule



The importance of the

Proposal Summary

- **It is generally required**
- **It will be the first thing that is read**
- **It could be all that is read**
- **It should 'frame' your proposal**
- **If the project is selected for SBIR support, the summary may well be the published (and readily available) statement of the project.**

To write it well takes time. Allow that amount of time required to do it well.

Abstract

A growing national need exists for an alternative to the standard gelatin photoplate (The Q-2 plate by ILFORD Co., England) essentially unchanged in the last four decades for recording mass spectra. There is not only general dissatisfaction with recent quality, but also the potential discontinuance of this difficult-to-manufacture, highly specialized, and, hence, unprofitable item. At present, the difficulty of obtaining Q-2 plates in the U.S. is indeed hurting an important segment of the scientific community--the field of spark-source mass spectrometry, pre-eminent for the trace analysis of environmental samples and chemical and cancer threats.

The very successful technology of IONOMET Co., in the vapor deposition of gelatin-free ion sensitive thin films, offers a viable solution. In this proposal, three approaches following a course of research in experimental photo science are documented. Our goal is feasibility research on novel structural modifications of silver halide thin films to meet the needs of quantitative analysis using spark-source mass spectrometry. In photographic language, the modifications are to bring about a reduction in contrast, and increase in latitude or dynamic range, and an increase in sensitivity. The proposed program is attractive since there are proven technical advantages in the gelatin-free system as compared with the Ilford gelatin emulsion photoplates required for ion detection.

Abstract of proposal submitted to NSF by the IONOMET Co., Lincoln Center, MA.

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FY 83 Disapproved SBIR Phase I Projects In NIH Referenced Deficiency		%
Problem Definition (62.5%)	Proposed research based on hypothesis insufficiently supported, doubtful or unsound	44.3
	Problem more complex than investigator appears to realize	15.3
	Problem of insufficient importance to warrent approval	10.8
Proposed Approach (79.2%)	Description of project too nebulous, diffuse, lacks clarity and/or provides insufficient information to permit adequate evaluation	48.6
	Overall project design not sufficiently thought through	28.1
	Facilities/ resources not described/ or adequate to purpose	10.5
	Statistical aspects of project inadequately considered	7.7
	Controls either inadequately described or not sufficiently described	6.8
	Materials proposed unsuited to objectives of the study	5.4
	Proposed test / methods / scientific procedures are unsuited/ unrelated to stated objectives	4.8
Investigator Experience (77.8%)	Investigator has inadequate experience/ training for this research	44.4
	Investigator appears unfamiliar with recent methods and/ or literature in this area	40.6
	Investigator needs more liaison with colleagues in this or collateral fields	10.9
	Collaborative arrangements not described/ documented	8.8
SBIR Factors (51.7%)	Limited potential for commercial application	23.0
	Little technological innovation	23.0
	Scale of proposed project unrealistic for amount of time allocated to Phase I	15.6
	Cost of project exceeds SBIR guidelines	6.0

Adapted from *Shortcomings found in disapproved SBIR Phase I projects reviewed for FY 83 action. Table 2.* National Institutes of Health Phase I, Small Business Innovation Applications: Fiscal Year 1983 results. Kirt J. Vener in Federal Proceedings, Volume 44. No. 11, August 1985.

Evaluation Criteria

In evaluating a proposal for scientific and technical merit, reviewers are required to consider:

- ☐ the significance and originality of the proposed research
- ☐ the appropriateness of the methodologies to achieve the objectives as defined
- ☐ the qualifications and experience of the investigator(s)
- ☐ the suitability of the available facilities
- ☐ the relevance of the submitted budget to the work to be done

—— Assume the evaluators know the current state-of-the-art and be able to indicate your awareness of work in that field.

—— Phase I is intended to be a preliminary proof-of-concept **feasibility study**, not a full blown project. Be realistic in pricing the work.

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Swampscott, MA



SBIR: Debriefing Protocols By Agency

Automatic		Written Request	
Agency	**Form of Debriefing**	**Agency**	**Form of Debriefing**
NSF	• Verbatim comments of reviewers • Rejection notice	**DOD**	• Summary of reviewer comments • Debriefing may also be requested by telephone
		NASA: **DOI: EPA**	• Summary of reviewer comments
HHS — NIH, ADAMHA and CDC process debriefings after the first of TWO technical reviews — all other HHS debriefings are processed after the second review. By written request, firms may receive a debriefing without priority scores after the first review.	• Verbatim comments of reviewers • Priority score	**DOE**	• Telephone. debriefing based on summary of verbatim comments of reviewers • Requests for debriefing must be made within 30 days of rejection notice
		USDA: DOT: **DoEd: NRC:**	• Verbatim comments of reviewer
		DOC	• Verbatim comments of reviewers • Priority score • Distribution of scores

Source: Adapted from PA SBIR News Volume I-1. July 1985. Compiled from SBIR solicitation documents and discussion with program administrators.

Innovation Development Institute
Swampscott, MA



Points to Remember

- [ ] **READ THE SOLICITATION**

  Look specifically for • the evaluation criteria and review process in that agency • what the agency can and, critically, cannot fund • likely availability of Phase II funding • relevant time frame-works • operating procedures • submission requirements etc.

- [ ] **RESPOND IN AN AREA OF YOUR BUSINESS EXPERTISE AND CAPACITIES**

  In design of the project(s) to be submitted, assume a business development emphasis focusing to where the SBIR funded project will go and how the available funds will enable you to get there.

- [ ] **MAKE IT A PRIORITY TO BECOME FAMILIAR WITH THE PARTICULAR AGENCY(IES)**

  Be aware of the type and form of project they support and, critically, with whom they more commonly do business

- [ ] **SPEND THE TIME TO REVIEW CAREFULLY THE CURRENT STATE-OF-THE-ART.** Be able systematically to reference that condition.

- [ ] **STRUCTURE THE PROJECT TO FIT**

  — amount of the available funds

  — the length of time available

- [ ] **ADDRESS ALL THE REQUIRED SECTIONS OF THE PROPOSAL**
  Be careful to use the format and the order specified by the agency. Pay particular attention to:

  1. **WHAT** will be done and **WHEN**
  2. **HOW** (and **WHY**) it will be done
  3. **WHO** will do it.

- [ ] **SEEK OUT AN INDEPENDENT, QUALIFIED REVIEWER**

  Edit and redraft in response to their input

All this takes time. Allow sufficient time to do the job well and to enable you to meet the established deadlines.

