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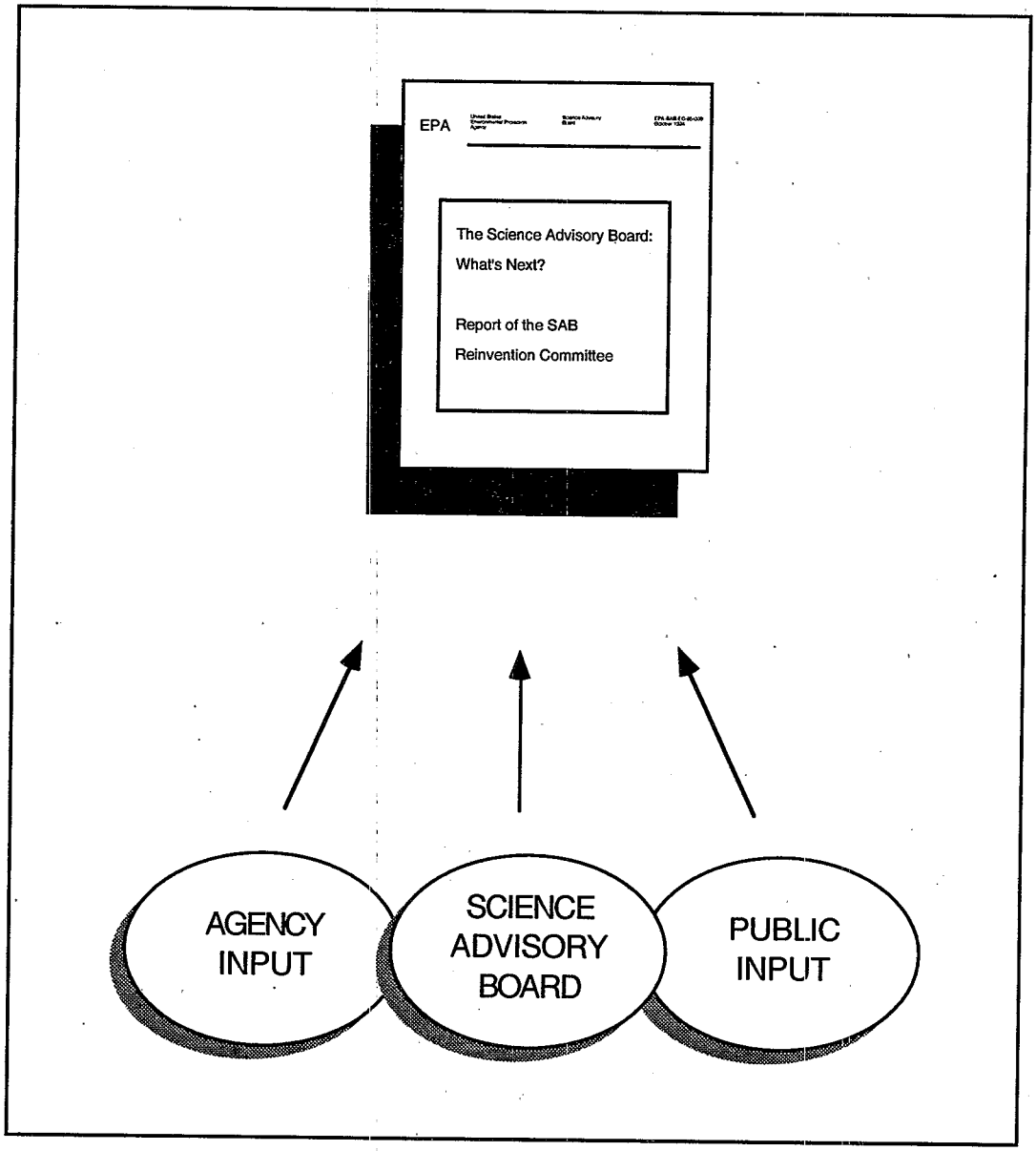
The Science Advisory Board: What's Next?

Report of the SAB Reinvention Committee



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The Science Advisory Board: What's Next?

Report of the SAB Reinvention Committee

Science Advisory Board
Washington, DC 20460

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Notice

This report has been written as a part of the internal operations of the Science Advisory Board (SAB), a public advisory group providing extramural scientific, engineering, and economic advice to the Administrator of the U.S. Environmental Protection Agency (EPA). This report has not been reviewed for approval by the Agency; and hence, the contents of the report do not necessarily represent the views and policies of the Agency or other agencies in the Federal government.

Acknowledgment

This study has benefited from the contributions of hundreds of people across the country. In contrast to most SAB efforts, the reinvention report has drawn upon the work, insights, and wisdom of SAB members and consultants, SAB staff, Agency headquarters personnel, Agency laboratory personnel, former Agency leaders, leaders in other agencies, and scores of members of the public—who are the ultimate and most important customers of the SAB.

We hope that we have been a faithful steward of the input from so many people and that the SAB will be a demonstrably better institution because of what they have done.

The Reinvention Committee
October 1994

Abstract

This report is the SAB's second self-study, a sequel to its *Mission and Functioning Report of 1989.* With a new SAB chair, a new Administrator, and a continually changing Board, it is both appropriate and instructive to consider "reinventing the SAB" at this time.

As background for this study, the Board received input from more than 100 people, including Agency political appointees (past and present), Agency personnel (from managers to bench scientists), Board members, representatives of other agencies, and members of the public.

The main substance of the report is captured in findings and recommendations related to eight SAB topics: mission, function, structure, selection of projects, timeliness, membership, inter-committee and inter-advisory group interactions, and communications.

The major conclusions have much in common with the earlier report:

a. The SAB works and makes a difference.

b. The SAB continually responds to changing conditions in an evolutionary, not revolutionary, way.

c. The SAB's effectiveness is directly tied to its real and perceived independence from the Agency.

d. The SAB can serve the Agency in a number of different ways:

1) Advising role; cf., consultations and advisories

2) Rigorous peer review role; cf., reports

3) Self-initiated activities; cf., commentaries

e. There is room for continual improvement, especially in the area of timeliness, membership, and communications.

KEYWORDS: U.S. EPA, Science Advisory Board, SAB, advisory

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Foreword

The SAB is fast approaching completion of its second decade of service to EPA, the Congress, and the public. During this time, the SAB has served as a valuable resource for providing advice to EPA in the Agency's efforts to generate and use sound scientific information as the basis for action to protect public health and the environment. Given the vast scope of Agency interests and responsibilities, the SAB continually faces challenging opportunities.

Therefore, it is important that the Board step aside periodically and take stock of the job that it is doing and seek ways in which it can do that job better.

In that spirit—the search for continuing improvement—the SAB undertook its second self-study early in 1994. We reviewed SAB activities and products, contacted Board members, interviewed Agency personnel (current and previous), and solicited input from the public. Our goal was to obtain a broad view of the SAB, as it is and as it is perceived to be by others.

The Science Advisory Board: What's Next? is the result of that effort. It should be noted, however, that this work builds upon the first self-study conducted by the SAB in 1989. For your convenience, Appendix A contains important excerpts from the 1989 *Mission and Functioning of the Science Advisory Board* report.

I want to express the thanks of the Board to all who played a part in the production of this report: the Board members and consultants, its reinvention committee, the staff of the Board, the Agency staff [particularly the Program Evaluation Division of the Office of Policy, Planning and Evaluation (OPPE)], and the many members of the public who participated in this review.

I invite all of them—and you, the reader—to join us in the implementation of the more than 40 recommendations which are included in this report. Together, we can make a good SAB even better.

Genevieve Matanoski, M.D., Dr. P.H.
Chair, Science Advisory Board
October 1994

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1. Executive Summary

This report is the SAB's second self-study, following its *Mission and Functioning (MAF) Report of 1989*. With a new SAB chair, a new Administrator, and a continually changing Board, it is both appropriate and instructive to consider "reinventing the SAB" at this time.

As background for this study, the Board received input from more than 100 people, including Agency political appointees (past and present), Agency personnel (from managers to bench scientists), Board members, representatives of other agencies, and members of the public.

The main substance of the report is captured in findings and recommendations related to eight topics:

SAB Mission
SAB Function
SAB Structure
Selection of SAB Projects
SAB Timeliness
SAB Membership
Inter-Committee and Inter-Advisory Group Interactions
SAB Communications

1.1 SAB Mission

1.1.1 Findings

a. There are several different views about what the purpose of the SAB should be.

b. The legislative language guiding the different SAB committees is significantly different from one another.

c. While there is general agreement that the SAB should focus on science issues rather than policy issues, there is a difference of opinion about what is "science" and what is "policy."

d. The absence of a succinct mission statement (in addition to the existing charter) for the SAB has led to confusion about the mission of the Board—in the public sector, in the Agency, and inside the Board—and the propriety of some SAB actions.

e. The self-study is a useful mechanism for reviewing the first principles of the SAB; (re-)educating SAB members about the Board; assessing the progress of the Board, as viewed by the members, the Agency, and the public; and gaining fresh insights on what further improvements can be made.

1.1.2 Recommendations

a. The SAB should develop a crisp mission statement.

b. The SAB should communicate its mission statement broadly.

c. The SAB should routinely review its activities in light of the mission statement.

d. The SAB and the Agency should enter into dialogue to better appreciate the different views at the science/policy interface.

e. The SAB should conduct a self-study on a regular (e.g., 5-year) basis.

1.2 SAB Function

1.2.1 Findings

a. The SAB provides advice on a range of matters (e.g., the merit of SAB scientific and technical products, research needs and management, and emerging environmental problems) through five major vehicles:

1) *De novo Reports*—substantial, original works, often generated at the invitation of top Agency leadership.

2) *Review Reports*—generally, written reviews of Agency products that are submitted to the Administrator.

3) *Commentaries*—generally, written, unsolicited advice on issues that the SAB feels should be drawn to the attention of the Administrator.

4) *Advisories*—recently introduced, written advice to the Administrator on Agency work products that are in the midst of development.

5) *Consultations*—generally, public discussions with Agency representatives about an issue of concern to the Agency, at a time when the Agency's approach to the problem is still being formulated. No consensus is sought.

b. Increasingly, the Agency would like to come to the Board early in the process to receive ideas on how to address a technical issue. Similarly, at various points throughout

the development of a technically based position, the Agency would like to have the option of receiving the benefit of the SAB's guidance/advice on its selected approach.

c. Early involvement of the Board may jeopardize the SAB's utility as an independent, objective peer reviewer at the end of the process.

d. While Agency access to the SAB can enhance information exchange, unlimited and nonpublic interaction between Agency personnel and the Board members can jeopardize the Board's perceived—and real—independence.

e. The increased use of the "charge" has proven to be an effective mechanism for focusing the Agency's—and the Board's—attention on the most important facets of a particular review.

f. The SAB and staff are working at near-maximum effort.

g. The SAB has limited, but successful, experience in hosting workshops on particular issues that should be receiving greater attention by the Agency.

1.2.2 Recommendations

a. The SAB should encourage further expansion of the *Consultation* concept as a means of leavening the Agency's thinking at the beginning of its development of scientific and technical positions.

b. The SAB should cautiously expand the use of its new work product, the *Advisory*. However, to retain independence, the SAB's subsequent review of the final product, the panel should have a substantial portion of panelists who did not participate in the *Advisory*.

c. The SAB should discourage one-on-one involvement between individual members and Agency personnel on matters that are before the Board for review. Both SAB members and Agency personnel should be circumspect on the matter, involving appropriate SAB staff when communication is needed.

d. The SAB should work more closely with the Agency to fulfill the potential of "the charge" as a mechanism to sharpen preparations for and expectations of SAB reviews.

e. The SAB needs to focus its efforts on the most important issues, improve its efficiency, and "work smarter." However, the Agency and public need to recognize that the Board and staff are resource-limited in terms of doing more.

f. The SAB should conduct public workshops, as appropriate, on topics that are in areas of science and technology that need greater attention and discussion.

1.3 SAB Structure

1.3.1 Findings

a. The current structure of the SAB is a mixture of discipline-oriented committees (e.g., Environmental Health Committee) and Agency-oriented committees (Drinking Water Committee).

b. Political appointees have recommended in the past that the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) Scientific Advisory Panel (SAP) and the Biotechnology Science Advisory Committee (BSAC) be incorporated into the SAB structure.

c. The structure of Board evolves over time, responding to various new issues, new needs, and new requests.

1.3.2 Recommendations

a. The current mix of discipline-oriented and Agency-oriented committees seems to serve the current needs of the Board and the Agency, although this matter should be reviewed on a regular basis.

b. The structure of the SAB committees should continue to evolve to adjust to changing conditions. The leadership of the Board should periodically consider the need for changes.

c. Increased cooperation should be sought between BSAC, SAP, and SAB, short of merging the groups.

1.4 Selection of SAB Projects

1.4.1 Findings

a. The Board's current process for selecting projects is broadly based through involvement of the Deputy Administrator, Assistant Administrators/Regional Administrators (AAs/RAs), the Council of Science Advisors, the SAB committees, the Executive Committee, and, on occasion, the Congress.

b. The SAB's current process is not well understood.

c. The SAB selection process will be affected by the Administrator's newly announced peer review policy.

d. All parties outside of the Agency—and a significant fraction within the Agency—agree that the SAB should include some self-initiated activities in its agenda.

e. There is a wide span of reaction to the notion that the SAB be "involved in policy."

1.4.2 Recommendations

a. The SAB should take steps to inform its various audiences about the project selection process.

b. The SAB should develop explicit criteria for use by the committees in guiding their development of self-initiated projects.

c. The Executive Committee should establish a small project selection subcommittee to

1) Develop guidelines and criteria to guide the process for selecting both Agency-initiated and SAB-initiated projects.

2) Examine adherence to project selection guidelines and criteria.

3) Seek opportunities for a mixture of members from different committees to address a given topic.

4) Seek opportunities for greater efficiency.

5) Advise the membership subcommittee (see below) on the upcoming issues so that appropriate members might be enlisted.

6) Comment on distribution of activities and resource levels across committees.

7) Serve as an early warning sentinel concerning emerging issues.

d. The SAB should clarify its understanding of and position on the science/policy interface.

e. The SAB staff should use elements of OPPE and the Office of Research and Development (ORD) to help identify issues that would benefit from SAB involvement.

f. The SAB staff should become more actively involved with the Agency committees that are implementing the peer review policy throughout the Agency. Such groups include

1) The Science Policy Council (SPC)

2) The steering committee of the SPC

3) The Peer Review Advisory Group (PRAG)

4) The office-specific parties who are responsible for overseeing and evaluating the peer review implementation

5) The Council of Science Advisors

6) Periodic participation in Office Directors' staff meetings

g. The chair of each committee should visit with the appropriate political appointees at least once a year with the goal of identifying specific issues for review.

1.5 SAB Timeliness

1.5.1 Findings

a. Timeliness is perceived to be a problem by many within the Agency, but less so by the Board and many outside the Agency.

b. The SAB review is only one element in the Agency's overall development of a position.

c. The SAB has demonstrated an ability to generate reviews quickly when the clear need arises and the materials are available.

d. The SAB has achieved its announced goal of reducing the average length of time between the last public meeting and transmittal of a report to the Administrator to about six months.

1.5.2 Recommendations

a. The SAB should take the next step in continuous quality improvement by adopting a goal of reducing the average length of time between the last public meeting and transmittal of a report to the Administrator to no more than four months.

b. To achieve this goal, the following process items should be explored:

1) Careful selection and review of projects so as to meet Agency and congressionally mandated schedules.

2) Earlier presentation of background and context to the SAB committee to avoid the need for extensive, detailed briefings at the review meeting itself.

3) Specific, succinct charges that focus the review on the main areas of scientific concern.

4) Careful scheduling of committee meetings to dovetail report production with upcoming Executive Committee meetings. (This should be a matter of discussion with the Agency during early negotiations on the charge, in order to have mutual expectations about delivery of the final report.)

5) Timely delivery of Agency documents to the Board, sufficient to allow a) critique of the charge in light of the documents, b) identification of required expertise and available experts, c) arrangement for adequate logistics, and d) studied preparation by the panel.

6) Setting priorities and conserving SAB and staff resources.

7) Ensuring that Agency personnel are present at SAB meetings.

8) Providing portable computers in order to compose draft text at meetings.

9) Consistent use of articulate exit debriefings at the end of the meeting.

10) Greater use of fax and email during report production.

11) Using vettors at the committee level and at the Executive Committee level.

12) Sending documents to lead discussants early enough that they can work with the Designated Federal Official (DFO) to resolve concerns prior to the Executive Committee meeting.

13) Greater use of "vetting" for more-or-less routine reports.

14) Closure on final edits before "vettors" leave Executive Committee meetings.

15) Experimental use of public conference calls for the Executive Committee to discuss "routine" reports.

1.6 SAB Membership

1.6.1 Findings

a. SAB panelists can participate on SAB panels in a number of different categories that are not well understood by many observers, which is a source of confusion and inconsistency.

b. The diversity of the Board (in terms of gender and ethnic origin) has increased significantly in recent years, although further progress is needed in this area, particularly in the case of minority participation.

c. The SAB has adopted "Guidelines for Service on the Science Advisory Board" that is increasing the rate of turnover on the Board. As a result the Board is losing some of its most involved members who have shaped the institution and who embody its memory.

d. The current membership selection process involves the public (*ad hoc* and by a biannual *Federal Register* notice), the Agency (by program office and Council of Science Advisors suggestions), and the SAB (by discussions with the committee chairs).

e. The ultimate selection is appropriately in the hands of the Administrator.

f. The selection process is not well understood.

g. In some quarters in the Agency there is concern about possible conflicts of interest related to membership on the Board.

1.6.2 Recommendations

a. The membership selection process should carefully consider issues coming before the Board for review.

b. In addition to subject-matter experts, there should be members on the Board who have a broad perspective of and diverse experience with science and the role of science in an agency like EPA.

c. The Executive Committee should establish a membership subcommittee that would

1) Help implement Executive Committee-established candidate selection criteria.

2) Help identify candidates.

3) Provide general guidance on membership selection.

4) Comment on overall balance, quality, and diversity of candidates for the Board.

d. The SAB should clearly articulate the member selection process.

e. The SAB should clarify the roles of "member," "consultant," "liaison," etc.

f. The SAB should augment its current process by concerted contact with special sources; e.g., professional societies.

g. The SAB should establish and flexibly apply two 2-year terms as the "normal tour of duty."

1.7 Inter-Committee and Inter-Advisory Group Interactions

1.7.1 Findings

a. Increasingly, the SAB has had fruitful interactions with the FIFRA SAP, through the conduct of a series of joint reviews and the regular participation of the SAP chair at Executive Committee meetings.

b. The SAB staff has initiated contact with advisory groups from other agencies to involve them (through charge questions and/or liaison members) in selected SAB reviews; e.g., lead paint, indirect exposure assessment, and "dioxin." The initiative has been supported by AA/Office of Prevention, Pesticide and Toxic Substances (OPPTS).

c. The SAB has been approached by a European Community advisory committee that is generating a report similar to *Reducing Risk*. The European group has expressed an interest in meeting with the SAB to discuss their mutual findings.

1.7.2 Recommendations

a. The SAB should seek out—on a onetime, issue-driven basis—additional opportunities to explore the benefits and disadvantages of interaction with other advisory groups, other agencies, or other countries; e.g., at least one liaison member from another agency's advisory committee for each suitable review.

b. The SAB should continue its trend toward greater use of liaison participation and joint reviews between committees; e.g., at least one liaison member from another committee for each suitable review.

c. In addition to its membership identification by committees, the SAB should maintain rosters of SAB members and consultants by expertise; i.e., identified "clusters" of epidemiologists, hydrologists, analytical chemists, paleobotanists, etc., to facilitate formation of multimedia, multi-disciplinary panels to address crosscutting issues.

1.8 SAB Communications

1.8.1 Findings

a. Communication is important to a successful, effective SAB.

b. Being in the Office of the Administrator improves communications.

c. The communications within the Agency regarding the SAB vary; e.g., biweekly reports to the political leadership, bimonthly distribution of *Happenings at the SAB,* oral reports at the Administrator's staff meetings, annual report, etc. There is no comprehensive strategic plan for communication.

d. The communications with the public also vary; e.g., trade press reports, introductory brochure, *Federal Register* notices, bimonthly distribution of *Happenings at the SAB,* etc.

e. Each SAB report is distributed to a standardized list of roughly two dozen individuals and institutions. In addition, roughly 200 requests for SAB reports are processed every month. And yet, the perception persists that the SAB work products are generally unknown.

f. The SAB is beginning to use the Agency "gopher" connection to the Internet to facilitate public access to SAB information.

g. The SAB members generally believe that they work on important issues. However, they often do not know much about the impact that their reports actually have. Similarly, Agency staff who prepare presentations for the SAB are often unaware of ultimate disposition of Agency responses to SAB comments.

1.8.2 Recommendations

a. Improved communications should be a major goal for the SAB during FY95.

b. The biweekly reports to the political leadership should be edited and transmitted to the SAB membership and SAB alumni.

c. The Board should reassess its approach to report distribution.

d. The mailing list of *Happenings* should be edited and more carefully targeted.

e. The SAB should exploit the Internet connection to the public (including the SAB members and consultants) in order to expand its communication capability.

f. Greater interaction between the SAB (members and staff) and top management at the Agency should be encouraged.

g. Focused procedures for gaining customer feedback following reviews should be implemented.

h. The Board should constantly and consistently reinforce its mission.

i. New members should be more effectively introduced to the Board.

j. The Executive Committee should be conscious of cost-effective ways of involving more members in the broader workings of the Board.

In short, the SAB is a vigorous, independent institution that is continuing to evolve in its mission of seeking to improve the quality of scientific, engineering, and economic bases of Agency decision making.

This self-study has been an important exercise for the Board. Like the 1989 MAF report, the study demonstrates the benefit of openly seeking constructive criticism from its various customers inside the Board, the Agency, and the public.

The major conclusions have much in common with the earlier report:

a. The SAB works and makes a difference.

b. The SAB continually responds to changing conditions in an evolutionary, not revolutionary, way.

c. The SAB's effectiveness is directly tied to its real and perceived independence from the Agency.

d. The SAB can serve the Agency in a number of different ways:

1) Advising role; cf., consultations and advisories

2) Rigorous peer review role; cf., reports

3) Self-initiated activities; cf., commentaries

e. There is room for continual improvement, especially in the area of timeliness, membership, and communications.

This report will be complemented by a study of the SAB staff office to be conducted by the Management and Organization (M&O) Division of the Agency's Office of Administration and Resource Management. It will constitute an updating of the 1989 M&O study of the SAB staff office.

Many of the more than 40 recommendations from this study should be implemented during FY95. Coupled with the recommendations from the upcoming M&O study, these data will provide the reinvention fuel to power the SAB to the brink of the next century.

2. Introduction: Why Reinvent Now?

The SAB is a vigorous, independent institution. Starting as a fledgling, congressionally mandated organization in the mid-1970s, the SAB has become an active force in bringing sound scientific and engineering information to bear on the technical aspects of both EPA's structure and its important regulatory decisions and guidance to the public.

The SAB currently maintains an active roster of 100 members and 300 consultants. These human resources are divided among 10 different standing committees,[1] coordinated through an Executive Committee. The committees of the Board conduct roughly 60 public meetings and generate over 30 written reports a year. The work of the SAB is supported by a staff office of 18 full time EPA employees, operating on a budget of just under $2M.

In 1989, the Board conducted its first self-study.[2] Led by Dr. William Lowrance of Rockefeller University, a small group[3] examined many aspects of the Board's operation; from mission to membership, from structure to resources. The executive summary of that report, along with its findings and recommendations are included in this report as Appendix A. In addition, the SAB staff office was studied by EPA's Management and Operations Division.[4] In the intervening five years both the Board and the staff office have taken action on most of the recommendations contained in those two reports.[5] Specific evolutionary modifications that reflect flexibility, responsiveness, and innovations made, in part, in response to the reports include the following:

- Provision of an explicit ecological focus through the establishment of the Ecological Processes and Effects Committee, plus addition of an at-large Executive Committee member with expertise in the area of ecology
- Provision of an explicit economics focus through the establishment of Environmental Economics Advisory Committee
- Establishment of the Clean Air Act Compliance Analysis Council
- Two-year experiment with an *ad hoc* membership subcommittee
- Increase of 25% in the number of committees and 50% in the number of members
- Greater integration among standing committees through the use of liaison members on specific issues
- More joint reviews with the Scientific Advisory Panel
- Greater emphasis on the executive nature of the Executive Committee through planning and interaction with top management of the Agency
- Acceptance of a request to lead a study of environmental futures
- Use of discussants and vettors to deal with reports from committees
- Introduction of annual SAB membership meetings
- Introduction of the consultation as a means of providing technical input to the Agency early in the process
- Introduction of advisories and commentaries as means of providing technical input in new ways
- Adoption of guidelines on terms of service on the SAB
- Adoption of explicit procedures for disclosure of potential conflicts of interest at public meetings
- Adoption of an SAB-wide policies on the release of draft documents and privately produced transcripts of SAB meetings
- Greater emphasis on developing the "charge" for SAB projects
- Experimentation with taking on regional-focused reviews
- Use of explicit criteria to guide selection of SAB projects
- Improvement in the timeliness of delivery of reports
- SAB representation on the Science Policy Council, the Deputy Administrator-chaired group dealing with science policy issues
- Upgraded publication of *Happenings at the SAB*
- Increased sophistication of the annual report
- Greater accessibility to and use of computers
- Restructuring of the staff to provide a focus for administrative support
- Increased professional growth opportunities for SAB staff

In 1992, Carol Browner came to EPA as a part of a new administration and quickly indicated that there was a "bias for

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[1] Clean Air Act Compliance Analysis Council (CAACAC)
Clean Air Scientific Advisory Committee (CASAC)
Drinking Water Committee (DWC)
Ecological Processes and Effects Committee (EPEC)
Environmental Economics Advisory Committee (EEAC)
Environmental Engineering Committee (EEC)
Environmental Health Committee (EHC)
Indoor Air Quality/Total Human Exposure Committee (IAQC)
Radiation Advisory Committee (RAC)
Research Strategies Advisory Committee (RSAC)

[2] *Report of the Mission and Functioning Committee*, SAB, 1989. The 1989 report provides valuable information and insights that have benefited the writers—and will benefit the readers—of this document.

[3] Dr. Paul Deisler (Consultant: Houston, TX), Dr. Roger McClellan (CIIT, President: Research Triangle Park, NC), and Dr. C.H. Ward (Rice University).

[4] *Report of the Management and Operations Division*, U.S. EPA, 1988.

[5] Action on these recommendations are generally chronicled in the Annual Reports of the SAB staff.

change" at the Agency. Since her arrival she has initiated a number of new thrusts (e.g., a new strategic plan[6] and an emerging process for defining environmental goals) and clearly articulated her commitment to a policy of environmental protection that is based on sound science. This approach meshed nicely with the government-wide Total Quality Management (TQM) thrust that urged organizations and people to continuously seek out methods for improving operations, products, and services.

In the fall of 1993 Administrator Browner appointed Dr. Genevieve Matanoski of The Johns Hopkins University as the new chair of the SAB Executive Committee, replacing Dr. Raymond Loehr of the University of Texas who had led the SAB for five years. Dr. Matanoski took the reins of a well regarded institution with a number of unique accomplishments to its credit.[7]

The influence of the SAB has been felt beyond EPA. For example, numerous inquiries have been received from different state and local jurisdictions.[8] Also, a number of federal agencies have visited the SAB with an eye toward improving their own advisory process. In 1993 Vice President Gore issued his *National Performance Review*[9] in which he made a series of recommendations, one of which bears directly on the concept of the SAB.[10] He also issued a series of challenges that would "streamline" government as we know it. Administrator Browner passed on that challenge to all offices in the Agency so that they would rethink their own operations.

Therefore, in light of all of the changes that have transpired over the past five years, both internal and external to the SAB, Dr. Matanoski judged that 1994 would be an appropriate time to take an in-depth, objective look at the structure and function of the SAB. Consequently, the Executive Committee authorized the establishment of an *ad hoc* reinvention committee (RC),[11] chaired by Dr. Matanoski, to conduct a self-study of the SAB and report back to the SAB membership on the important findings and recommendations that should guide the organization into the next century.

Section 3 of this report describes the conduct of the reinvention study itself. Section 4 contains the findings and recommendations in each of eight specific areas. Section 5 is a brief summary of the major conclusions of this study. The report contains five appendices that amplify on points made in the main text. Also, the PED and MAF reports should be consulted for additional background and information.

[6] "The New Generation of Environmental Protection: A Summary of EPA's Five-Year Strategic Plan," July 1994. (EPA-200-2-94-001).

[7] For example, *Future Risk* (1988) did much to determine the thrust of EPA research in this decade. Similarly, *Reducing Risk* (1990) highlighted the importance of comparative risk in an era of limited resources.

[8] Within the past three years inquiries about how one might develop an SAB-like organization have been received from the governors' offices of California, Washington, and Florida. In addition, the mayor's office of the city of Columbus, OH, has established an Environment Advisory Committee, modeled closely after the SAB.

[9] *National Performance Review: Reinventing the Federal Government*, Office of the Vice President, 1993.

[10] One of the recommendations was that all science-related regulatory agencies should have a Science Advisory Board, implicitly modeled after the SAB of the EPA.

[11] The RC membership was composed of all members of the Executive Committee who were not currently serving as chairs of standing committees.

3. The Process of the Reinvention Study

In keeping with the tenets of TQM, the reinvention study was based on a) an attempt to align with the Board's "customers," both inside and outside EPA, b) the considered insights of SAB committees, and c) extensive data collection. The intent of the data collection was to gather a range of perceptions about the SAB and capture individual ideas and innovative suggestions. The study was *not* designed to provide a statistically valid view of the Board and its activities.

3.1 Phase I

During Phase I of the study, attention was focused primarily on the SAB and the Agency. Among the activities in Phase I were the following:

a. The Program Evaluation Division (PED)[12] of OPPE agreed to conduct a study of the Agency's reaction to the SAB. Working with SAB Reinvention Committee (RC) staff,[13] the PED group interviewed over fifty EPA employees, from the Administrator's office to the lab bench in Cincinnati and Research Triangle Park. Coupled with focus group sessions, the PED group succeeded in reaching a range of Agency customers who could not have been credibly contacted by SAB staff alone.

The results of the work are contained in "Science Advisory Board Reinvention Project: Agency Interview Data Summary," (Publication number: EPA-230-R-94-017). A synopsis of the take-home messages is found in Appendix B.

b. Ms. Yvette Hellyer[14] coordinated an internal SAB staff-led effort to develop and distribute a questionnaire to readers of the SAB newsletter, *Happenings at the SAB*. Four hundred questionnaires were distributed to those on the mailing list. Eighty-five responses were received and results compiled. The copy of the questionnaire and summary of responses are found in Appendix C.

c. Members of the RC conducted telephone interviews with current and former political appointees at the Agency. See Appendix D.

d. The SAB standing committees were invited to conduct their own self-studies by reviewing their experience and work products of the years. The goal was to identify those aspects of their efforts that were particularly successful—by various measures—and that might be used to guide such efforts in the future. The EEC and the RAC[15] accepted the invitation and their reports will be released by the SAB in early FY95.

3.2 Phase II

In Phase II of the study, the focus shifted to perceptions of the SAB held by those outside the Agency. There were three principal activities in this portion of the study:

a. The SAB staff conducted telephone interviews with representatives of the business community and the environmental community. The organizations and interviewees were selected by the RC staff from suggestions submitted by SAB members and members of the staff themselves. The staff consciously sought individuals who were likely to have some knowledge of the SAB. See Appendix D.

b. The SAB staff conducted a "benchmarking" study by interviewing individuals closely involved with technical advisory committees for other groups, both inside and outside government. See Appendix D.

The RC also conducted two public meetings: June 14, 1994, and Sept 8, 1994. In addition, the group conferred on a near monthly basis to discuss progress and to provide guidance for the RC staff.

On July 14, 1994, the RC met with the Executive Committee to discuss the results of the reinvention study up to that time. In a morning session the group met with Agency managers[16] to gather additional information. In a public session in the afternoon, they discussed draft findings and recommenda-

[12] Pam Stirling, PED Director, appointed Len Fleckenstein to coordinate the project. The project leader was Kristina Heinemann, who was ably assisted by Gabriella Lombardi, Joel Jones, Gwen Wise, Lynda Dowling, and Charlotte White. Their efforts provided unique, critical insights that could not have been captured otherwise. As such, their report was an invaluable source of data for this study.

[13] The SAB reinvention staff included Don Barnes (Chair), Randall Bond, Janice Cuevas, Manuel Gomez, Yvette Hellyer, and Jason Holstine.

[14] Ms. Hellyer (OPPT) served a 3-month detail to the SAB staff office, developing questionnaires, organizing information, interfacing with the PED operation, etc. The RC is indebted to her for her considerable management and organizational skills.

[15] Even before the reinvention exercise began, Dr. Oddvar Nygaard, former RAC Chair, had initiated the committee's own "retrospective study." The RAC, the RC, and the SAB owe Dr. Nygaard a debt for adapting his study to the current effort.

[16] Dr. Roger Cortesi, ORD; Dr. Elizabeth Cotsworth, Office of Solid Waste; Dr. Tudor Davies; and Elizabeth Milewski, OPPTS.

tions. Following a public meeting on September 8, 1994, the RC prepared a final report for review and acceptance by the Executive Committee during a conference call in late September. The Executive Committee intends to present the report to the entire SAB membership at the annual meeting on October 26, 1994, for their reaction, which will guide implementation of the recommendations.

4. Findings and Recommendations

In general, this reinvention study is a natural extension of the SAB's first self-study, *The MAF Report* (1989), which summarized important information about the origins of the SAB, its mission, and its operations. Coupled with the annual reports of the SAB staff[17] and the draft history of the Board,[18] the MAF Report provides a rich source of insight about the operations of the SAB and forms an important companion document to this report. Major highlights and recommendations from the MAF report are found in Appendix A.

The history of the SAB since the 1989 report has been one of a natural evolution, with the main trunk continuing to grow on its set course, while side branches have sprouted, developed, and often generated fruit of their own. In fact, to restrict the size of the current report, the RC reaffirms the findings and recommendations in the MAF Report, except in those instances in which specific findings and recommendations in this report specifically alters them.

In this section, the RC presents its findings and recommendations in each of eight major areas of interest that emerged during the course of the study.

4.1 SAB Mission

4.1.1 Findings

a. There are several different views about what the purpose of the SAB should be.

Taken together, the data gathered for the reinvention study revealed a wide range of what the mission of the Board is or should be. Some regarded the SAB as a type of "science Supreme Court" that should render final peer review opinions—when asked—about the scientific and technical basis of the Agency's positions. Others felt that the SAB should be a more collegial advisor, regularly available to provide real time counsel as the Agency struggles with scientific and technical matters. Still others—most often, those outside the Agency—felt that the SAB should be independent, proactive, and directive in telling the Agency how to address and react to scientific and technical issues.

b. The legislative language guiding the different SAB committees is significantly different from one another.

Separate pieces of legislation mandate specific committees within the SAB; other committees are referenced, but not explicitly named.[19] Therefore, the results are somewhat different in each case. For example, the Clean Air Act (1977) explicitly calls for CASAC to advise on the possible adverse economic, social, etc., impacts of clean air standards. In contrast, ERDDAA speaks of the role of the SAB as more restricted to scientific and technical issues.

c. While there is general agreement that the SAB should focus on science issues rather than policy issues, there is a difference of opinion about what is "science" and what is "policy."

Science and policy are both multifaceted subjects,[20] and in the context of the EPA's work they can interface in many ways, interpenetrating each other. The SAB has traditionally tried to avoid areas that clearly involve policy or policy judgments. On the occasions where this has been necessary, the SAB has carefully acknowledged this fact and tried to offer its reasons for doing so; cf., the caveat in *Reducing Risk*, the SAB's 1990 report on relative environmental risks.[21]

However, as evidence in interviews and responses to questionnaires, some Agency managers believe that the Board moves into policy areas with sufficient regularity to be of concern.

d. The absence of a succinct mission statement (in addition to the existing charter) for the SAB has led to confusion about the mission of the Board—in the public sector, in the Agency, and inside the Board—and about the propriety of some SAB actions.

[17] Annual reports of the SAB have been produced each year since the mid-1980s.

[18] Bush, Perry, "Uneasy Partners: A History and Analysis of the EPA's Science Advisory Board." This draft was commissioned by the SAB Staff and accepted by the EC as information in 1990.

[19] For example, the SAB was established under the Environmental Research, Development, and Demonstration Authorization Act (ERDDAA) of 1978. CASAC was established in the Clean Air Act of 1977. CAACAC was established under the Clean Air Act Amendments of 1990. The activities of some other committees are referenced in legislation; e.g., IAQC in the Superfund legislation and DWC the Safe Drinking Water Act.

[20] This issue is discussed more fully in Sections 3.1 ("SAB's Purview Science *for* Environmental Protection") and 3.2 "Consideration of Science in Context") on pp. 6-8 of the MAF report.

[21] "...This particular project was conducted at the request of the EPA Administrator and addresses a broader range of issues and concerns than most SAB reports. Consequently, many of the findings and recommendations in this report have more of a policy orientation than is usually the case."

A perceived lack of clarity about "proper SAB activity" can lead to misunderstanding among members of the public, misdirected energies among members of the SAB, and differences between the Agency and the Board. In fact, some such differences are no doubt inevitable and constitute a sign of healthy independence of the SAB from the Agency. At the same time, a mission statement would help improve effective communication and mutual understanding, if not totally eliminate controversy.

e. The self-study is a useful mechanism for reviewing the first principles of the SAB; (re-)educating SAB members about the Board; assessing the progress of the Board, as viewed by the members, the Agency, and the public; and gaining fresh insights on what further improvements can be made.

In conducting this self-study, the SAB has been forced to confront some fundamental questions about what it is and what it does. This "looking into the mirror" is valuable in many ways. For example, this study generates insights as to how effective the Board is and how it is viewed by others. Further, it provides an opportunity to explore how other advisory committees function.

4.1.2 Recommendations

a. The SAB should develop a crisp mission statement.

The mission statement should be a succinct description of what the SAB does, and why. It should include the following points:

1) The SAB is independent from the Agency.

2) The SAB is advisory to the Agency.

3) The SAB seeks to improve the quality of the scientific and technical basis of activities at EPA, both the production of that basis and its use in Agency decision making.

4) The types of activities of the SAB are found in the charters of the SAB, CAACAC, and CASAC. These may be alluded to but are not necessarily all enumerated in the mission statement.

The MAF report provides a good base upon which to construct a good mission statement[22] and should be consulted when developing an updated mission statement.

b. The SAB should communicate its mission statement broadly.

By repeated, widespread use, a clear and succinct mission statement can provide, clarify, and publicize an identity for the organization. Such a widely understood identity can help the members to better understand their function and the Agency and the public to better use the products of the SAB.

c. The SAB should routinely review its activities in light of the mission statement.

The SAB staff director should report semiannually to the Executive Committee on the extent and distribution of the Board activities, compared to what is envisioned in the mission statement and the charters of SAB committees. This review will help to inculcate the mission statement in the collective minds of the Board and to make it a reality in their individual actions.

d. The SAB and the Agency should enter into dialogue to better appreciate the different views at the science/policy interface.

The different perceptions about the presence and extent of SAB involvement in policy issues needs to be addressed directly. As noted in the findings, to an extent, the different viewpoints are a healthy sign of independence of the Board from the Agency. Therefore, no amount of discussion should be expected to resolve all issues. However, a frank exchange will help both the SAB and the Agency to better understand the perspective of the other.

A third party-facilitated meeting between selected SAB members and Agency managers, using recent SAB reports as examples, could clarify the different viewpoints, spotlighting the many points held in common and highlighting those areas where differences exist and are likely to remain.

e. The SAB should conduct a self-study on a regular (e.g., 5-year) basis.

The self-study experience of the Board over the past six years has shown the value of such a review—to the Board, the Agency, and the public. Given the new rotational membership policy, we can anticipate that the SAB chair, the members of the Executive Committee, and more than half of the Board will turn over within a five-year period. Therefore, it is important that the Board periodically reexamine its roots, its purpose, and its direction in some disciplined way. In addition, a regular assessment of the Board's progress and promise will highlight areas where TQM improvements can be made.

4.2 SAB Function

4.2.1 Findings

a. The SAB provides advice on a range of matters (e.g., the merit of SAB scientific and technical products, research needs and management, and emerging environmental problems) through five major vehicles:

1) *De novo Reports*—substantial, original works, often generated at the invitation of top Agency leadership.

2) *Review Reports*—generally, written reviews of Agency products that are submitted to the Administrator.

[22] Sections 2.2 ("SAB's Aiding-and-extending Mission") and 2.3 ("SAB's Auditing-and certifying Mission"), pp. 4-6, MAF report.

3) *Commentaries*—generally, written, unsolicited advice on issues that the SAB feels should be drawn to the attention of the Administrator.

4) *Advisories*—recently introduced, written advice to the Administrator on Agency work products that are in the midst of development.

5) *Consultations*—generally, public discussions with Agency representatives about an issue of concern to the Agency, at a time when the Agency's approach to the problem is still being formulated. No consensus is sought.

In recent years the SAB has generated a few *De novo Reports* at the request of the Administrator; cf., *Future Risk, Reducing Risk,* and *Beyond the Horizon* (a work in progress by the Environmental Futures Committee). These efforts have had major impacts on the Agency—and beyond—but have raised concerns in some quarters about the SAB possibly delving into policy matters that go beyond strictly technical issues.

The *Review Reports* have been the principal staple of the SAB for many years. Many of the *Review Reports* deal with Agency technical work products that will form the basis of Agency risk management decisions.

The relatively recent introduction of *Commentaries* has provided an outlet for the SAB committees to express themselves on an as-needed basis. Some of these commentaries have had major impacts; e.g., EEC commentary on modelling and the RAC-DWC commentary on radon in drinking water. In most cases, top management has welcomed *Commentaries* as valuable advice from a unique perspective. In some cases, Agency personnel have been concerned that *Commentaries* impinge on issues in the risk management realm, without an appreciation of the constraints (legislative and resource) under which Agency managers must operate.

The most recently introduced SAB vehicle, the *Advisory*, came into being as a response to an Agency-expressed need for real-time collegial advice (cf., peer involvement), in addition to an end-of-process formal peer review. The *Advisory* occurs at a point beyond that at which a *Consultation* and before that at which a *Review Report* would be appropriate.

The *Consultation* is more of a collegial discussion than it is a peer review. No report is written. A standard "Notice of Consultation" informs the Administrator that the SAB has met with the Agency on a particular topic, but no details are provided and no response is expected. SAB members are free to provide oral and/or written comments as individuals. The intent is to leaven the Agency's thinking with a range of ideas/approaches to consider.

This approach has been well received by the Board members and by the Agency. The public meeting involves comparatively little preparation by either the SAB or the Agency. From the Agency's point of view, the *Consultation* is a low-risk and potentially high-payoff encounter.

b. Increasingly, the Agency would like to come to the Board early in the process to receive ideas about how to address technical issues. Similarly, at various points throughout the development of a position, the Agency would like to have the option of receiving the benefit of the SAB's guidance/advice on its selected approach; hence the *Advisory*.

In recent months a number of offices have been "pushing the envelope" of the *Consultation*. As strictly defined, the *Consultation* occurs *before* the Agency has determined how it is going to approach a problem. Operationally, this means that a *Consultation* would occur before the Agency had developed a document. Lately, program offices have been coming to the SAB staff with "draft documents that do not yet represent Agency positions" and for which they would like some SAB reaction.

Therefore, in FY94 the SAB introduced the *Advisory*.

c. Early involvement of the Board may jeopardize the SAB's utility as an independent, objective peer reviewer at the end of the process.

The SAB has been concerned about maintaining its independence from the development of an Agency document in order that the Board might provide the perception and reality of a rigorous, independent, objective peer review of the Agency's final document. The more the SAB is involved in providing advice on a work under development (i.e., generating an *Advisory*), the more difficult it is to maintain that independence—in reality, and in the eye of public.

d. While Agency access to the SAB can enhance information exchange, unlimited and nonpublic interaction between Agency personnel and the Board members can jeopardize the Board's real and perceived independence.

Experience has shown that close interaction between Agency personnel and Board members can lead to improved Agency products. However, this nonpublic, "thesis advisor" role is at variance with the rigorous peer review function envisioned by many on the SAB and in the public.

Therefore, the Board and the Agency need to be circumspect in their interactions, recognizing that they have a responsibility to maintain an arms length relationship, so as to conduct a credible peer review at the end of the process, if so requested.

e. The increased use of the "charge" has proven to be an effective mechanism for focusing the Agency's—and the Board's—attention on the most important facets of a particular review.

Over the past five years the SAB has more rigorously followed the practice of negotiating a "charge" with the Agency prior to conducting a review. The charge is a mutually agreed upon set of questions that will be answered by the Board during the course of its meeting. The charge is "defining, but not constraining"; i.e., it clarifies the Agency's need and the SAB's focus, but it does not restrict the Board from providing

technical comments on any or all portions of the Agency's document.

Increasingly, the charge is being viewed by the Agency and the SAB as a valuable tool for opening clear channels of communication and forging quality reviews.

f. The SAB and staff are working at near-maximum effort.

Most SAB members are working near maximum capacity.[23] If additional functions were to be adopted by the Board, it could mean the addition of new members to take on those tasks.

All of the SAB staff is working at near-maximum capacity. While responsibilities and operations have broadened, the FTEs available to carry out the work have actually decreased by more than 20% in the past 5 years. Even though efficiencies have been gained through new equipment, training, and centralized office functions, the office has, on occasion, fallen short of providing the SAB members with the level of support they feel they need to provide timely, quality advice to the Administrator.

The SAB is aware that the Office of Management and Operations will be studying the organization and operation of the SAB staff office this fall. However, study alone will not solve the problem.

g. The SAB has limited, but successful, experience hosting workshops on particular issues that should be receiving greater attention by the Agency.

Two years ago the SAB hosted a workshop on technical issues associated with leaching mechanisms. The proceedings were videotaped and made available to EPA programs and regions. As a direct result of the workshop, the Environmental Engineering Committee sent a Commentary to the Administrator identifying particular issues that needed to be addressed in any Agency modeling and testing associated with leaching.[24] The effort was well received inside and outside the Agency.

Several other crosscutting technical issues exist that could benefit from an objective workshop sponsored/promoted by the SAB.

4.2.2 Recommendations

a. The SAB should encourage further expansion of the *Consultation* concept as a means of leavening the Agency's thinking at the beginning of its development of scientific and technical positions.

There is a real need for early thoughts to help the Agency obtain a full spectrum of possibilities and to gain a sense of the breadth of views that exists in the technical community, before the Agency commits itself to a particular direction of development.

b. The SAB should cautiously expand the use of its new work product, the *Advisory*. However, to retain independence, the SAB's subsequent review of the final product should have a substantial presence of panelists who did not participate in the *Advisory*.

The aim of the *Advisory* is to emphasize advice on how the Agency is addressing an issue, rather than peer review on how the Agency has dealt with the issue to date. By pointing out potential problems early on and suggesting alternative approaches, the SAB can help the Agency explore creative ways to address the complex technical issues that lie at the heart of many environmental problems.

In FY94 the Board transmitted two *Advisories* to the Administrator.

The Board needs to ensure that review of a final product that has benefited from an *Advisory* is independent and objective. Therefore, the final review group should have a substantial presence of new panelists. As a practical matter, one could also assign more senior SAB members (in terms of length of SAB service) to the *Advisory* group, with the expectation that they would have rotated off the Board by the time the final product comes to the committee for formal review.

c. The SAB should discourage one-on-one involvement between individual members and Agency personnel on matters that are before the Board for review. Both SAB members and Agency personnel should be circumspect on the matter, involving appropriate SAB staff when communication is needed.

The SAB has an obligation to the Agency *and* to the public to remain fair and objective. Therefore, the Board must—in fact and in appearance—remain independent throughout the review process. This does not preclude the SAB practice of sharing draft reports with the Agency and the public as it seeks reaction on matters of fact, clarity of expression, and completion of the charge. It is the responsibility of the SAB staff to ensure that interactions between the Board and the Agency do not jeopardize the public trust in that relationship.

d. The SAB should work more closely with the Agency to fulfill the potential of "the charge" as a mechanism to sharpen preparations for and expectations of SAB reviews.

The charge should continue to evolve as a central focusing device for SAB reviews. The charge should become a negotiated document between the SAB and the Agency. Input to the charge can be sought from other parties who have technical expertise and concerns about the matter at hand. These technical queries could be raised by other agencies, other advisory groups, and/or members of the public.

e. The SAB needs to focus its efforts on the most important issues, improve its efficiency, and "work smarter." However, the Agency and public need to recognize that the

[23] However, some SAB Committees have encountered unexpected and disconcerting slack periods due to postponement or cancellation of reviews by the Agency.

[24] "Leachability Phenomena—Recommendations and Rationale for Analysis of Contaminant Release," (EPA-SAB-EEC-92-003)

Board and staff are resource-limited in terms of doing more.

As the scope of SAB functions expand, the Board will have to continue to improve its operating procedures. However, even with these improvements, it is clear that the Board and the staff will require additional resources to fulfill the expectations of the various parties. For example, in FY94 the Board was able to address roughly a third of the requests received from the program offices and regions. With the implementation of the new Agency peer review policy,[25] the number of requests directed to the Board is likely to rise even higher.

f. The SAB should conduct public workshops, as appropriate, on topics that are in areas of science and technology that need greater attention and discussion.

Given the success of previous workshops, it would be useful to use this mechanism more frequently.

4.3 SAB Structure

4.3.1 Findings

a. The current structure of the SAB is a mixture of discipline-oriented committees (e.g., Environmental Health Committee) and Agency-oriented committees (Drinking Water Committee)

The structure of the Board has evolved over time, as a result of historical precedents, congressional direction, and Administrator requests. For example, the two most recently added committees—EEAC and CAACAC—represent, respectively, a discipline-oriented committee and an Agency-oriented committee. The current state of the Board is more a result of pragmatic reaction than strategic design.

b. Political appointees have recommended in the past that the FIFRA SAP and the BSAC be incorporated into the SAB structure.

The former AA/OPPTS (Linda Fisher) recommended that the two technical advisory committees in her office (SAP and BSAC) become a part of the SAB. She felt that advice on technical matters to the Agency should come through a single advisory body. Subsequent to that recommendation, there have been a number of discussions and internal studies on the matter. To date, there has been little enthusiasm to implement the recommendation, given the current resource constraints and somewhat different operating methods of the groups. Also, increased participation by the SAP chair in Executive Committee activities, coupled with increased joint reviews, has led to closer cooperation between SAB and SAP than has existed in previous years.

c. The structure of the Board evolves over time, responding to various new issues, new needs, and new requests.

Since the MAF report, the number of committees have increased by 25%: in one case, in response to a congressional initiative (CAACAC, under the Clean Air Act Amendments of 1990) and, in another case, in response to a request from the Administrator (EEAC, as a result of a 1990 request).

4.3.2 Recommendations

a. The current mix of discipline-oriented and Agency-oriented committees seems to serve the current needs of the Board and the Agency, although this matter should be reviewed on a regular basis.

Once a year, the Executive Committee should reexamine its committee structure to determine how well it matches with shifting Agency priorities and emerging issues of greatest importance. The Executive Committee should regularly confer with the Administrator to determine how best to organize itself to address the needs and priorities of the Agency. As structural changes become necessary and following full consideration of questions of implementation, the Executive Committee should take appropriate action and describe any changes to the rest of the Board at the annual membership meeting in October.

b. The structure of the SAB committees should continue to evolve in order to adjust to changing conditions. The leadership of the Board should periodically consider the need for changes.

Each of the committees should regularly address the need for changes in their structure. For example,

1) With the rising interest in social sciences research, the EEAC might consider expanding its scope by changing its name to the Environmental Socioeconomics Committee and taking on more social sciences issues beyond economics. This change would explicitly acknowledge the presence of non-economists on the committee and facilitate recruitment of members from a broader range of disciplines in the future.

2) The EEC might consider changing its name to the Environmental Engineering and Technology Committee, thereby acknowledging what is already the case, while explicitly emphasizing the importance of technology.

3) The EEC should also explore establishing a special subcommittee to interact with the Superfund and Resource Conservation and Recovery Act (RCRA) programs; i.e., a waste programs subcommittee. This would provide a clear focus of SAB activity for the Office of Solid Waste and Emergency Response (OSWER), one of the largest programs in the Agency, thereby holding the promise of increasing the interaction between the program and the Board.

4) The RSAC should consider enlarging in order to cover all of the research interests represented on the Board. This could be done by having the chairs of the standing committees serve as RSAC members or by having each committee designate a "vice-chair for R&D" who would serve in this capacity. This

[25] Administrator's memorandum, "Peer Review Program," June 7, 1994.

vice-chair would also chair the committee's RSAC-related review of ORD issue plans.

c. Increased cooperation should be sought between BSAC, SAP, and SAB, short of merging the groups.

In the absence of greater expressed commitment to the advantages of the merging of the groups, the SAB should remain separate from the SAP and the BSAC. However, increased cooperation—including joint reviews of mutually appropriate issues—should be encouraged. If, at some point in the future, the Agency determines affirmatively that merging the groups would be useful and associated resource questions can be adequately addressed, this recommendation should be revisited.

4.4 Selection of SAB Projects

4.4.1 Findings

a. The Board's current process for selecting projects is broadly based through involvement of the Deputy Administrator, the AAs/RAs, the Council of Science Advisors, the SAB committees, the Executive Committee, and, on occasion, the Congress.

Each spring the Deputy Administrator directs the AAs/RAs to send requests for SAB reviews to the SAB staff. This information is shared with the Agency's Council of Science Advisors in order to obtain a cross-Agency perspective. The resulting lists are provided to the SAB committees to help them construct their activities for the coming fiscal year. On occasion, the Board is directed by Congress to conduct selected reviews; e.g., the annual ORD budget review, the recent review of the multimedia risk assessment for radon, and the review of the EPA Lab Study.

b. The SAB's current process is not well understood.

The above procedure is not generally well understood, particularly by those who are not a part of the exercise itself; e.g., members of the public and Agency scientists who may not become directly involved in the process. Some of these people express frustration at not having access to the selection process.

c. The SAB selection process will be affected by the Administrator's newly announced peer review policy.

On June 7, 1994, the Administrator released a peer review policy that directs that every "major technical work product" receive independent peer review, preferably by outside experts. In implementing the policy, regions and program offices are identifying all technical products generated in their units, the subset of those that are "major," and the mechanisms by which they will obtain peer review. The policy identifies at least 14 different acceptable peer review mechanisms, of which the SAB is only one.

On one hand, the requests for SAB review may rise dramatically, since the Board is acknowledged as a quality peer review mechanism that is viewed as "cost free" to the regions and the program offices. On the other hand, the SAB staff has made it clear that the Board should not be viewed as the preferred mechanism simply "because it is there." In fact, the staff has indicated that the recognition and availability of alternative mechanisms should free up the Board to devote its efforts more exclusively to the broader, cross-Agency issues, rather than program- or region-specific concerns.

It is not yet clear how these competing views of SAB capability and capacity will evolve.

d. All parties outside of the Agency—and a significant fraction within the Agency—agree that the SAB should include some self-initiated activities in its agenda.

Historically, a fraction of the Board's activities have been self-initiated; i.e., reports/commentaries that are not explicitly requested by the Agency. These activities reflect broader, independent concerns of the committees, generally born of their observations about some scientific issue at the Agency; e.g., the RAC commentary on the different approaches to risk assessment for chemicals vs. radioactivity.

SAB observers generally believe that such self-initiated activity is valuable to the process. However, intra- and extra-Agency parties differ significantly on the percentage of SAB activities that should be self-initiated.

e. There is a wide span of reaction to the notion that the SAB be "involved in policy."

This spectrum of views is due to several reasons. First, policy, like beauty, is oft in the eye of the beholder. Second, as the National Academy of Sciences noted, while the broad distinction between risk assessment and risk management is clear, the boundary between science and policy can be uncertain in some cases; e.g., determining whether the selection of particular uncertainty factors is science or policy. Third, the SAB is often directed to address the policy implications of scientific findings, but *not* to tell the Agency what to do in the policy realm; cf. CASAC charter. Fourth, on occasion the SAB has been asked to address issues beyond the science/policy interface. In such cases the SAB explicitly acknowledges the fact; cf., *Reducing Risk.*

4.4.2 Recommendations

a. The SAB should take steps to inform its various audiences about the project selection process.

As the Agency's peer review policy takes hold and the SAB's role therein becomes more clear, it will become increasingly important that the SAB's project selection process be well understood. Therefore, the SAB should publicize its project selection process, inside and outside the Agency, through organs such as the *Risk Newsletter* (directed primarily inside the Agency) and *Happenings at the SAB* and the SAB staff's annual report (directed both inside and outside the Agency.)

b. The SAB should develop explicit criteria for use by the committees in guiding their development of self-initiated projects.

While self-initiated activities are endorsed by all parties, it would be wise to provide guidance for the committees and members as they contemplate proposals for self-initiated activities. The RC offers the following as potential criteria:

1) The issue is one that has come before the Board in various guises in the past and based upon specific comments offered in the past, the Board believes that more generic guidance would be helpful to the Agency. For example, the EEC resolution on computer modeling, (EPA-SAB-EEC-89-012).

2) The issue is one that involves two or more program offices who do not appear to be coordinating their activities. For example, the RAC commentary on relative risks of radon, (EPA-SAB-RAC-COM-93-014).

3) The issue is fundamental to the way science is conducted or interpreted in the Agency. For example, the RSAC report on the EPA Lab Study, (EPA-SAB-RSAC-94-015).

4) The issue is one that will help the SAB do a better job of advising the Administrator. For example, the RAC retrospective study of its activities (in preparation).

5) The level of self-initiated activities should not adversely affect (by time and other resource impacts) the Board's ability to respond to the Agency's priority needs.

6) The inherent value of a self-initiated activity should have the potential of being equivalent to that of an Agency-requested activity.

c. The Executive Committee should establish a small project selection subcommittee to

1) Develop guidelines and criteria to guide the project selection process for both Agency-initiated and self-initiated projects.

2) Examine adherence to project selection guidelines and criteria.

3) Seek opportunities for a mixture of members from different committees to address a given topic.

4) Seek opportunities for greater efficiency.

5) Advise the membership subcommittee (see below) on the upcoming issues so that appropriate members might be enlisted.

6) Comment on distribution of activity and resource levels across committees.

7) Serve as an early warning sentinel concerning emerging issues.

The SAB needs to address its project selection process more strategically. A project selection subcommittee of the Executive Committee, working with the SAB staff, can provide guidance and oversight to help bring this about.

A draft description of such a subcommittee is found in the Appendix E.

d. The SAB should clarify its understanding of and position on the science/policy interface.

As noted above, the issue of the science/policy interface has arisen in a number of quarters. The Executive Committee should take the lead in drafting a position statement on the issue that will clarify the Board's view on the matter and will guide the committees as they conduct their business in the future. Such a statement should build on material in the MAF report, particularly Section 3.1 and 3.2 on pp. 6-8. A strawman draft of such a position paper is found in the Appendix F and can serve as a starting point for a formal statement.

The Board should be clear in noting where in its reports it is nudging the science/policy interface and when it is crossing more directly into the policy arena; cf., disclaimer in *Reducing Risk.*

As noted in 4.1.2.d, the RC is recommending that the Board work with the Agency to conduct a third party-facilitated forum in which the perceptions of science/policy interface can be shared and historical cases discussed as concrete examples of concerns having been raised at the interface.

e. The SAB staff should use elements of OPPE and ORD to help identify issues that would benefit from SAB involvement.

The range of issues that could/should come to the SAB for consideration is quite large. For example, more than 300 issues have been identified in the regulatory development process this summer. The SAB should leverage its limited resources by working closely with those elements of ORD and OPPE whose responsibility it is to assure that "good science" is consistently reflected in Agency positions. This mechanism should help to identify those issues that could most benefit from SAB review and input.

f. The SAB staff should become more actively involved with the Agency committees that are implementing the peer review policy throughout the Agency. Such groups include

1) The SPC

2) The steering committee of the SPC

3) The PRAG

4) The office-specific parties who are responsible for overseeing and evaluating the peer review implementation

5) The Council of Science Advisors

6) Periodic participation in Office Directors' staff meetings

The SAB staff need to become actively involved with those organizations in the Agency that are most likely to be focusing on science issues of fundamental importance to the Agency. The SAB staff director is a member of the SPC and its steering committee, as well as the Council of Science Advisors. In addition, the SAB staff could benefit professionally, while augmenting the outreach of the Board, by pursuing some of the other listed options.

g. The chair of each committee should visit with the appropriate political appointees at the Agency at least once a year with the goal of identifying specific issues for review.

Experience has shown that meetings between SAB committee chairs and political appointees are especially useful in clarifying ways in which the SAB can be of assistance to the leadership of the Agency. These encounters provide opportunities for frank exchanges and exploratory discussions that are very beneficial in identifying specific issues for SAB involvement.

4.5 SAB Timeliness

4.5.1 Findings

a. Timeliness is perceived to be a problem by many within the Agency, but less so by the Board and many outside the Agency.

The questionnaires from and interviews with people inside the Agency generally revealed that many of them believe that "the SAB process is too long." These people refer to the need for speedy responses in order to meet externally dictated deadlines.

Board members and respondents from outside the Agency often cited benefits from reports that are more accurately described as being "carefully considered" than being "timely."

b. The SAB review is only one element in the Agency's overall development of a position.

Often a formal SAB review comes at the end of a long development process that has extended over a period of years. If the Board recommends significant changes, the time-requirement consequences of the review can be considerable, even if the review itself is relatively rapid.

c. The SAB has demonstrated an ability to generate reviews quickly when the clear need arises and the materials are available.

The Board has regularly responded to tight deadlines of congressionally mandated reviews of Agency activities (e.g., ORD budget review, multimedia radon risk assessment, and EPA lab study) in a matter of a few weeks, and sometimes a few days.

Often the rate-determining step for the Board is the Agency's developing a focused charge and making materials available for review, so that a) a meeting date can be firmly established, b) members can be recruited for the particular review, and c) members can have sufficient time to study the materials prior to the meeting.

d. The SAB has achieved its announced goal of reducing the average length of time between the last public meeting and transmittal of a report to the Administrator to about six months.

Just a few years ago the average length of time between the last public meeting and transmittal of a report to the Administrator was eight months. Today that time is six months.

The SAB uses a number of devices to get the advice to the Agency quickly and reliably, including

1) Conducting meetings in public.

2) Summarizing, to the degree possible, responses to the charge in public session.

3) Increasing the use of computer and electronic linkages to facilitate generation, completion, and distribution of reports.

4.5.2 Recommendations

a. The SAB should take the next step in continuous quality improvement by adopting a goal of reducing the average length of time between the last public meeting and transmittal of a report to the Administrator to no more than four months.

The process for report generation should be analyzed to determine where additional time savings can be gained. In the spirit of continuous improvement, the Board should challenge itself to find ways to accelerate the process further, without sacrificing quality. In fact, greater timeliness can lead to greater quality in that the advice can often have a greater impact when it is delivered in a timely manner.

b. To achieve this goal, the following process items should be explored:

1) Careful selection and review of projects so as to meet Agency and congressionally mandated schedules.

2) Earlier presentation of background and context to the SAB committee, in order to avoid the need for extensive, detailed briefings at the review meeting itself.

3) Specific, succinct charges that focus the review on the main areas of scientific concern.

4) Careful scheduling of committee meetings to dovetail report production with upcoming Executive Committee meetings. (This should be a matter of discussion with the Agency during early negotiations on the

charge, in order to have mutual expectations about delivery of the final report.)

5) Timely delivery of Agency documents to the Board, sufficient to allow a) critique of the charge in light of the documents, b) identification of required expertise and available experts, c) arrangement of adequate logistics, and d) studied preparation by the panel.

6) Setting priorities and conserving SAB and staff resources.

7) Ensuring that Agency personnel are present at SAB meetings.

8) Providing portable computers to compose draft text at meetings.

9) Consistent use of articulate exit debriefings at the end of the meeting.

10) Greater use of fax and email during report production.

11) Using vettors at the committee level, as well as at the Executive Committee level.

12) Sending documents to lead discussants early enough that they can work with the DFO to resolve concerns prior to the Executive Committee meeting.

13) Greater use of "vetting" for more-or-less routine reports.

14) Closure on final edits before "vettors" leave Executive Committee meetings.

15) Experimental use of public conference calls for the Executive Committee to discuss "routine" reports.

While some of these techniques have already been used in selected instances, they have not been routinely a part of all SAB committee activities. The Board should continue to work with the Agency to explore additional approaches, insights, etc. that can be adapted to accelerate the report production/delivery process.

4.6 SAB Membership

4.6.1 Findings

a. SAB panelists can participate in SAB panels in a number of different categories that are not well understood by many observers, which is a source of confusion and inconsistency.

Participants in SAB panels can carry a number of different labels; e.g., member, consultant, special government employee (SGE), SGE-without compensation, representative, liaison, and federal liaison. See Appendix G. The subtle distinctions among these categories (which are not mutually exclusive) are not clearly and consistently made between different committees and different panels.

b. The diversity of the Board (in terms of gender and ethnic origin) has increased significantly in recent years, although further progress is needed in this area, particularly in the case of minority participation.

The percentage of women on the Board has increased from 11% in FY92 to 20% in FY94. In the same time span, the percentage of minorities has increased from 1% to 11%. The current percentages meet or exceed the percentage of women and minorities in the population of doctoral scientists and engineers employed in the U.S.

The Executive Committee has expressed a desire to broaden the diversity of the Board further, consistent with the prime objective of enlisting qualified members who can provide the type of sound, technically relevant advice that is the hallmark of the SAB.

c. The SAB has adopted "Guidelines for Service on the Science Advisory Board"[26] that is increasing the rate of turnover on the Board. As a result, the Board is losing some its most involved members who have shaped the institution and who embody its memory.

In recent years the Executive Committee has adopted membership guidelines designed to increase the turnover of members on the Board.[27] As a result, the average length of service among Board members has decreased by more than 25% in the space of three years.[28] The result is that most of the members who were present with the Board during its early years and its most trying years have—or are about to—rotate off the Board. This transition represents both a substantial influx of new faces and new thoughts and a potentially significant loss in understanding of the Board's mission and its role in the context of EPA.

d. The current membership selection process involves the public (*ad hoc* and by a biannual *Federal Register* notice), the Agency (by program office and Council of Science Advisors suggestions), and the SAB (by discussions with the committee chairs).

The current membership selection process involves outreach to many different groups inside and outside the Board, and inside and outside the Agency.

e. The ultimate selection is appropriately in the hands of the Administrator.

The SAB charters clearly identify the Administrator as the appointing official for SAB members. The SAB and the SAB staff view their membership recommendations as strictly ad-

[26] *Annual Report of the Science Advisory Board Staff*, Appendix D, 1993.

[27] Members are appointed by the Administrator for a 2-year term, renewable twice (6 years). Members who are appointed as chairs of committees normally serve up to two 2-year terms in that capacity; i.e., 4 additional years beyond that served as a member.

[28] The average length of service of SAB members in FY95 will be less than 3 years.

visory, focusing on technical excellence and balance of legitimate technical points of view.

f. The selection process is not well understood.

Interviews and questionnaires revealed that the membership selection process is not well understood by many in the public, the Agency, and the SAB.

g. In some quarters within the Agency there is concern about possible conflicts of interest related to membership on the Board.

Over the past two years, there has been increased concern about conflict-of-interest issues in the federal government, including EPA. Some concerns have been expressed regarding SAB members related to grants and contracts from the Agency. The SAB staff has worked with the Office of the General Counsel to gain assurance that the SAB members are currently adhering to all of the conflict-of-interest requirements.

4.6.2 Recommendations

a. The membership selection process should carefully consider issues coming before the Board for review.

SAB members should be selected primarily on the basis of their scientific, engineering, and economic talent to contribute credible advice on technical issues that are coming to the Administrator for decision. This directive places a premium on accurately anticipating the issues that are likely to come forward for decisions.

However, while accurate anticipation may be possible for major issues (e.g., "dioxin" risk assessment), many issues cannot be projected more than one year in advance.

b. In addition to subject-matter experts, there should be members on the Board who have a broad perspective of and diverse experience with science and the role of science in an agency like EPA.

Some of the most valuable members of the Board have been those who have a broad perspective of how science can assist the decision making process in a regulatory context. Such members couple technical strengths and insights with practical wisdom and outlook. These individuals are often helpful in conducting a rigorous peer review while, if needed, giving advice on alternative approaches to analyzing limited data under constraints faced by the Agency.

c. The Executive Committee should establish a membership subcommittee that would

1) Help implement Executive Committee-established selection criteria for members.

2) Help identify candidates.

3) Provide general guidance on membership selection.

4) Comment on overall balance, quality, and diversity of candidates for the Board.

The Executive Committee established an *ad hoc* membership subcommittee in 1990 for a two-year trial. Due to a number of circumstances, including rotation of the subcommittee chair from the Board, the group was disbanded.

Further experience has revealed the utility of such a group; and therefore, it should be reinstituted.

d. The SAB should clearly articulate the member selection process.

The SAB should draft and publicize a succinct statement of its membership selection process. The elements of such a document exist in the Guidelines for Service on the SAB, in the biannual *Federal Register* notice on SAB membership, and in materials prepared by the SAB staff in response to focused FOIA requests; e.g., those dealing with the SAB's review of the environmental tobacco smoke risk assessment.

e. The SAB should clarify the roles of "member," "consultant," "liaison," etc.

The membership subcommittee should articulate such distinctions. For example, in general,[29] the roles of SAB members and consultants are similar, yet distinct. Members are regular participants appointed by the Administrator. Should a vote on an issue ever arise, all members can participate, even members from committees other than the committee that is leading the review. By contrast, consultants are *ad hoc* participants appointed by the SAB staff director who participate in consensus discussions but do not formally vote on issues before the committee. Once a consensus is reached, the chair may explicitly ask if any SAB member objects to the consensus. Minority opinions can be included from either members or consultants.

f. The SAB should augment its current process by concerted contact with special sources; e.g., professional societies.

Currently the SAB's contact with outside groups regarding membership selection is unfocused. The membership subcommittee should work with the SAB staff to uniformly contact professional societies and other groups with targeted messages regarding SAB membership.

g. The SAB should establish and flexibly apply two 2-year terms as the "normal tour of duty."

The current membership guidelines refer to 2-year appointments, renewable twice; i.e., 6 years of service. In fact, most members serve for six years. In order to encourage greater turnover on the Board, the normal tour of duty should be 4 years, not 6 years. In practice, this directive should be implemented with flexibility so that certain individuals will be

[29] CASAC and CAACAC, being separately chartered groups, may be somewhat different.

asked to serve for a third 2-year term. However, this should become more the exception than the rule.

4.7 Inter-Committee and Inter-Advisory Group Interactions

4.7.1 Findings

a. Increasingly, the SAB has had fruitful interactions with the FIFRA SAP, through the conduct of a series of joint reviews and the regular participation of the SAP chair at Executive Committee meetings.

Over the past three years the SAP and SAB have worked more closely—and productively—together. This development was prompted, in part, by a recommendation by the AA/OPPTS that the SAP become a part of the SAB. While the staff in the Office of Pesticide Programs examined the proposal in greater detail, the two advisory groups moved toward alignment through joint reviews and through the active participation of the SAP chair at the meetings of the SAB Executive Committee.

b. The SAB staff has initiated contact with advisory groups from other agencies to involve them (through charge questions and/or liaison members) in selected SAB reviews; e.g., lead paint, indirect exposure assessment, and "dioxin." The initiative has been supported by AA/OPPTS.

A case in point is a review of aspects of hazards posed by lead, proposed by OPPTS. The Board of Scientific Counselors of the Agency for Toxic Substance and Disease Registry (ATSDR) was contacted and arrangements made for liaison participation by a member of that group on the SAB committee conducting the review. Further discussions with ATSDR and the Food and Drug Administration have prompted expressions of interest in joint reviews in the future.

c. The SAB has been approached by a European Community advisory committee that is generating a report similar to *Reducing Risk*. The European group has expressed an interest in meeting with the SAB to discuss their mutual findings.

While travel restrictions and time constraints may limit the Board's participation in this particular activity, the inquiry suggests additional avenues and future opportunities to harness extra-government expertise in the process of providing technical advice to governmental bodies.

4.7.2 Recommendations

a. The SAB should seek out—on a onetime, issue-driven basis—additional opportunities to explore the benefits and disadvantages of interaction with other advisory groups, other agencies, or other countries; e.g., at least one liaison member from another agency's advisory committee for each suitable review.

The principal role of the SAB is to provide independent, technical advice to the Administrator of EPA. At the same time, the Board should carefully explore interaction with other advisory groups as a mechanism by which the Board can provide better advice to the Administrator and, collaterally, have an impact on other groups as well. These outreaches should be onetime activities with groups external to EPA, with a thorough evaluation and discussion of the experience before pursuing additional interactions.

b. The SAB should continue its trend toward greater use of liaison participation and joint reviews between committees; e.g., at least one liaison member from another committee for each suitable review.

In the past three years, the Board has moved toward more interaction among the SAB committees. These have ranged from individual liaison members for specific reviews, to a complex, multi-committee coordinated review (RCRA-Regulatory Input Analysis), to permanent mixed-discipline membership on a given committee (CAACAC). These initiatives have been effective in broadening the scope and applicability of the advice rendered by the Board. Further explorations in this area should be pursued.

c. In addition to its membership identification by committees, the SAB should maintain rosters of SAB members and consultants by expertise; i.e., identified "clusters" of epidemiologists, hydrologists, etc. (including generalists) to facilitate formation of multimedia, multi-disciplinary panels to address crosscutting issues.

To facilitate sharing of expertise among committees and among advisory groups, it would be helpful for the SAB staff to develop rosters of SAB members by "expertise clusters."

4.8 SAB Communications

4.8.1 Findings

a. Communication is important to a successful, effective SAB.

The SAB is charged with providing advice to the Administrator. In addition, the Board has a responsibility to communicate with a number of constituencies, including Agency personnel, Congress, the public, and the Board members themselves. The views of the SAB are acknowledged as authoritative and are sought after and used in a variety of circumstances. When such communications are muted or nonexistent, problems can—and do—emerge. Therefore, good SAB communications accrues to the benefit of all.

b. Being in the Office of the Administrator improves communications.

By reporting to the Administrator, the Board's advice is heard directly at the highest level without a lower level filter. Similarly, interactions with the program offices carry an important authority that would be missing if the Board were housed at a lower level. The Board is seen as operating above the interoffice conflicts.

In like fashion, the Board's association with the Administrator's office attaches additional weight to its activities, as seen by other agencies, the Congress, and the public.

c. The communications within the Agency regarding the SAB vary; e.g., biweekly reports to the political leadership, bimonthly distribution of *Happenings at the SAB*, oral reports at the Administrator's staff meetings, annual report, etc. There is no comprehensive strategic plan for communication.

While there are many avenues of communication with and from the SAB, the organization lacks a comprehensive approach for getting its messages—process issues and reports—out to the variety of audiences that exist within the Agency; e.g., political appointees, career staff, scientists.

d. The communications with the public also vary; e.g., trade press reports, introductory brochure, *Federal Register* notices, and bimonthly distribution of *Happenings at the SAB*.

Again, while there are many useful activities and products, there is no coordinated, strategic approach to getting the Board's messages out to targeted audiences.

e. Each SAB report is distributed to a standardized list of roughly two dozen individuals and institutions. In addition, roughly 200 requests for SAB reports are processed every month. And yet, the perception persists that the SAB work products are generally unknown.

The requests for SAB reports continue apace. In rare instances (e.g., *Reducing Risk*) the requests reach into the tens of thousands. At the same time, many people comment that the SAB reports are not readily accessible to individuals outside the Agency who would like to have them.

f. The SAB is beginning to use the Agency "gopher" connection to the Internet to facilitate public access to SAB information.

In keeping with the Vice President's initiative, the Agency is conducting a concerted effort to make its products more available to the public, both in the U.S. and abroad. There is now an EPA "gopher" that guides an Internet user through the labyrinth of Agency resources. In an attempt to make the SAB work products available to a worldwide audience, the staff office is mounting SAB reports on the Agency's gopher so that the information becomes readily available via the Internet. Although there is a selected audience on the Internet, that audience is rapidly growing.

g. The SAB members generally believe that they work on important issues. However, they often do not know much about the impact that their reports actually have. Similarly, Agency staff who prepare presentations for the SAB are often unaware of ultimate disposition of Agency responses to SAB comments.

In many instances individual SAB members do not receive informative feedback on the impact of SAB reports. Although the Administrator may generate responses that are sent to members involved in the generation of the report, these responses are generally short and do not always reflect how the Agency will act upon SAB advice in the last analysis.

The PED interviews also revealed that EPA scientific and technical staff who have made presentations before the Board are similarly uninformed about the Agency's ultimate disposition of SAB comments.

4.8.2 Recommendations

a. Improved communications should be a major goal for the SAB during FY95.

The Executive Committee should establish a small subcommittee to help the staff office develop a strategic plan for communication within the Board, between the Board and the Agency, and between the Board and the public, including Congress. Such a plan should include "customer surveys" of existing communication efforts. For example, the readership of *Happenings* should be queried regarding general effectiveness and customer preferences on format and content. Alternative ways of presenting *Happenings* and reports should be explored; e.g., different formatting for greater "flash."

b. The biweekly reports to the political leadership should be edited and transmitted to the SAB membership and SAB alumni.

The staff office should use the biweekly reports to the Administrator as a mechanism for instituting a regular communication to all Board members. The information (<2 pages) should include concise summaries of recent activities, controversial items, emerging issues (especially self-initiated activities), and a near-term calendar. It should not be duplicative of *Happenings*.

c. The Board should reassess its approach to report distribution.

The principal products of the Board are its reports, which should be of high quality and easily accessible. Therefore, the Board should examine the best strategic and most effective distribution procedures. Possibilities include

1) Systematic distribution to the Library of Congress.

2) Assignment of ISBN numbers to reports.

3) Effective use of National Technical Information Service.

4) Announcements of reports in professional newsletters.

5) On some occasions, generation of press releases.

6) Greater use of electronic distribution.

d. The mailing list of *Happenings* should be edited and more carefully targeted.

Happenings and other SAB communication organs should be more carefully targeted at audiences that are most interested in the information, most affected by the information, and most likely to use the information, including sharing it with others. For example, including trade press (e.g., *Inside EPA*) and professional society newsletters (e.g., *Society of Environmental Journalists*) on the distribution list can have a multiplier effect. Among groups for targeting are the following:

1) EPA lab directors

2) Science staffs and policy staffs at other agencies

3) State environmental directors

4) Directors of research institutions

5) SAB alumni

e. The SAB should exploit the Internet connection to the public (including the SAB members and consultants) in order to expand its communication capability.

The SAB should explore the current and emerging mechanisms for making information more readily accessible to a worldwide audience. Possibilities include using the EPA gopher, employing email distribution lists, and establishing an SAB listserver as a means of quickly getting SAB information to people who want it. Such mechanisms should be exploited to sending information out (e.g., introduction to the SAB and SAB reports) and receiving feedback from the various parties.

f. Greater interaction between the SAB (members and staff) and top management at the Agency should be encouraged.

The SAB committee chairs should meet with Office Directors prior to formal reviews to clarify any subtleties in the charge and to discuss mutual expectations. They should try to debrief personally the relevant office directors following a substantive review. Also, they should make it a point to meet one-on-one with the AAs at least once a year. Further, personnel from the SAB staff should become periodic, if not frequent, participants in the staff meetings of AAs and Office Directors.

g. Focused procedures for gaining customer feedback following reviews should be implemented.

The SAB should develop a systematic method for assessing reaction from Agency staff in the wake of an SAB review. This would include the quality and quantity of advice, its relevance and timeliness, and views about the SAB review process itself.

h. The Board should constantly and consistently reinforce its mission.

The mission of the SAB should be continually presented in simple, plain English. For example, *Happenings* should have a brief statement/slogan about the Board's mission as a part of the masthead.

i. New members should be more effectively introduced to the Board.

New members receive only a modest introduction to the Board. Materials should be prepared especially for them[30] that will lead them into the broader workings of the Board. For example, an introductory session for new members could be held on the morning of the annual membership meeting.

j. The Executive Committee should be conscious of cost-effective ways of involving more members in the broader workings of the Board.

For example, subcommittee authors of reports should always be present by telephone during Executive Committee discussions of their reports. In some instances it might even be worthwhile to bring the member(s) to a meeting in which their report will be discussed.

Another useful mechanism would be for the Staff Director to attend each meeting of the SAB committees and to summarize developments in the "greater SAB."

[30] This could include, for example, the SAB charter, standing committee charters, the MAF report, the RC report, conflict-of-interest information, and information on administrative rules (e.g., travel, airlines, etc.).

5. Conclusion

This self-study has been an important exercise for the Board. Like the 1989 MAF report, the study demonstrates the benefit of openly seeking constructive criticism from its various customers inside the Board, the Agency, and the public.

The major conclusions have much in common with the earlier report:

a. The SAB works and makes a difference.

b. The SAB continually responds to changing conditions in an evolutionary, not revolutionary, way.

c. The SAB's effectiveness is directly tied to its real and perceived independence from the Agency.

d. The SAB can serve the Agency in a number of different ways:

1) Advising role; cf., consultations and advisories

2) Rigorous peer review role; cf., reports

3) Self-initiated activities; cf., commentaries

e. There is room for continual improvement, especially in the area of timeliness, membership, and communications.

This report will be complemented by a study of the SAB staff office to be conducted by the M&O Division of the Agency's Office of Administration and Resource Management. It will constitute an updating of the 1989 M&O study of the SAB staff office.

The more than 40 recommendations from this study should be implemented during FY95. Coupled with the recommendations from the upcoming M&O study, these data will provide the reinvention fuel to power the SAB to the brink of the next century.

Appendix A—Excerpts from the Mission and Functioning of the EPA Science Advisory Board, October 1989

Executive Summary

Over recent years the need and demand for advisory service by the SAB has increased substantially, and the diversity of issues brought before the Board has increased as well. This has strained the Board's capabilities, even while it has raised challenging, important opportunities for stewardship.

In the spring of 1989 the SAB Executive Committee decided to take stock, and it requested that an *ad hoc* subcommittee conduct a broad review of the mission and functioning of the Board. This report from the subcommittee to the Board presents findings and proposals that can be reacted to and implemented as the SAB and the Agency wish.

The subcommittee believes that the basic legislated mandate and the administrative charter of the Board are appropriate and adequate. The Board has two principal missions: an aiding-and-extending mission and an auditing-and-certifying mission. Its overall purview is science for environmental protection—that is, science, not policy; and science not just for regulation, but for protection of the environment by the whole range of means available to the EPA.

Currently the SAB performs the following functions: reviewing the quality and relevance of particular regulatory science; reviewing generic regulatory-scientific approaches; reviewing research programs; reviewing the technical bases of various applied programs; advising on infrastructural and technical management issues; advising on emergencies and other short-notice problems; and advising on broad, strategic matters.

The report suggests that the SAB would contribute even more if several other functions were added or upgraded: providing scientific forums and pursuing outreach; advising on aspects of implementation and communication; and helping the Agency anticipate problems and act more strategically.

As to internal SAB improvements, the report recommends more active involvement of the Board in nominating new Board members; recommends broadening of recruitment and diversification of representation in Board membership; recommends some alterations in SAB committee structure; and recommends heightened leadership by the SAB Executive Committee in relating with the Agency and other organizations, in setting project priorities, and in orchestrating the Board's activities.

As to external reach and relationships, the report recommends expansion of SAB coverage of Agency programs; recommends more deliberate selection, planning, and timing advisory projects by both the Board and the Agency; recommends more active coordination with other advisory bodies; and recommends more vigorous outreach to various scientific communities and to the public.

As to workload and resources, the report recommends that the SAB staff support computers; computer efficiency be improved; and the budget be increased to match the expectations, demands, and opportunities of SAB advisory service. The Board's infrastructure needs to be renewed.

Overall, the report makes a number of recommendations meant to improve the SAB's ability to help the EPA anticipate environmental issues and act more strategically in addressing them.

Recommendations and Findings

Recommendation on Terms of Service

The variance in lengths of appointments strikes this subcommittee as unnecessarily irregular. The Board and the Deputy Administrator should examine the desirability of appointing all members to two-year terms, renewable twice, with a hiatus of at least two years required before the member becomes re-eligible for further reappointment. Terms of service for committee chairs, for which cumulated SAB experience is important, should be treated exceptionally (such as by waiving the break-in-service requirement).

Recommendation on Executive Committee Nomination of SAB Candidates

The Executive Committee should systematically solicit suggestions from the committees, survey the capabilities needed for handling upcoming issues, discuss particular talents, consider SAB breadth and balance, and nominate candidates for SAB service to the Administrator. (To encourage candid discussion, these would be among the few occasions on which it is proprietous to close the meetings to public observers.)

Recommendations on SAB Recruitment

The Executive Committee should establish an *ad hoc* membership nomination subcommittee to work with the standing SAB committees to identify and nominate a diverse roster of the

experts required for the Board, making special effort to recruit well qualified women and minority scientists. Also this nomination subcommittee should attend to the balance of representation from different institutional and technical points-of-view.

Finding on Conflict-of-Interest Safeguards

To this subcommittee, and surely to the Board, the paramount objective is that the SAB be in position to render the most insightful, broadly experienced, pragmatic scientific advice possible. In this light, the current conflict-of-interest precautions—if fully observed—seem entirely adequate.

Finding on Committee Structure

With the exception of the ecological and drinking water areas (being attended to, as discussed below), the subcommittee believes the current stable of committees generally is adequate. The committee structure matches the Agency's complex organization fairly well. And, especially by employing *ad hoc* subcommittees, the SAB is able to put together appropriate panels on issues coming up for attention.

Finding and Recommendation on ad hoc *Subcommittees*

For many purposes *ad hoc* subcommittees are a flexible way to organize, and they generally work satisfactorily. But *ad hoc* groups should be set up only when the standing committees and subcommittees cannot do the job at hand, and firm lead responsibility for *ad hoc* efforts should be assigned to standing committees whenever possible. The intention should be to respect and preserve the standing committees' functions, and to keep *ad hoc* efforts firmly integrated with the work of the standing committees.

Recommendation on Reorganizing to Handle Ecological Issues Better

The Board should

- establish an Ecological Processes and Effects Committee (EPEC) with a very broad mandate, having special interest in the effects of contaminants on ecological systems;
- convert the present Environmental Effects, Transport, and Fate Committee into an Environmental Transport and Fate Subcommittee of the new EPEC; and
- charge the Environmental Engineering Committee with continuing to analyze transport and fate phenomena that are associated with engineered sources or processes (such as mining operations and waste-handling).

Recommendations on Intercommittee Coordination

- All committees should make continual efforts to be sure that they are aware of other committees' work, and to apprise other committees of upcoming activities.
- Where committees find themselves routinely intersecting, they should consider designating liaisons, perhaps even appointing a few members to two committees concurrently. If they find themselves overlapping redundantly, they should review the organizational structure and territorial boundaries.
- The Board should consider holding an SAB annual meeting at which all of the committees would first conduct their business separately, then meet in various combinations and in plenary session. With proper scheduling and planning, this could be at least as efficient as the usual separate committee meetings and could offer bonus opportunities for coordination, planning, and collegial exchange. Also, it could provide a very effective forum for discussions with top EPA officials and with leaders of a variety of external organizations.

Recommendation on Executive Committee Responsibilities

The Executive Committee should consider its principal tasks to be

- "Scanning the environmental horizon," sorting out priorities, and setting the broad SAB agenda;
- Representing the Board to the Administrator, the Assistant Administrators, and the laboratory directors;
- Conveying high-level Agency concerns to the SAB;
- Searching out and nominating candidates for SAB service;
- Outlining and chartering the committees' review and advisory tasks;
- Coordinating the work of the various committees;
- Receiving advisory reports from the committees, vetting them, and endorsing and transmitting them to the Administrator (CASAC excepted); and
- Representing the Board to the larger scientific and technical communities and incorporating their input.

Recommendations on Executive Committee Shaping and Assigning of Committee Tasks

- On all major projects, whether initiated by the committees or by the Executive Committee or by other sources, the Executive Committee should, to whatever extent is appropriate, debate the involvement of committees, the scope of the issues to be investigated, the general approaches to be taken, the Agency context surrounding the projects, and how the projects fit into the environmental "big picture."
- The Executive Committee must work harder at assembling and tasking the trans-committee teams that increasingly are being required. In consultation with the

committees, it must assign the lead responsibilities, develop clear charges and terms-of-reference for projects, and carefully allocate personnel and other sources.

- Overall, the Executive Committee must establish and drive the SAB's "agenda" meant in both its grand and task-and-timing senses.

Recommendations on Executive Committee Transmittal of Reports

- The Executive Committee should continue to reserve for itself the role of transmitting reports to the Administrator, with the chair of the Executive Committee (who is the chair of the SAB) signing the letters of transmittal.

- At the beginning of an SAB inquiry, the Executive Committee should concern itself principally with the competence and appropriateness of the committee assigned to conduct the study and with the charge to the committee.

- When an inquiry has been completed and submitted to the Executive Committee for transmittal, the Executive Committee should examine the extent to which the charge has been fulfilled, the adequacy of the committee's consultation with other elements of the SAB with which there is overlapping or spinoff concern, the clarity of the evaluative logic within the review, the quality of the report as a communication (readability, focus, contexting, documentation), and plans for follow-through.

Recommendation on the Administrator as the Addressee of Formal SAB Advice

For formal purposes, the Administrator himself—or, at least, the collectivity that goes by that name, "the Twelfth Floor" of headquarters, the Office of the Administrator—should continue to be the primary recipient of EPA formal SAB advice. It remains the Administrator's prerogative to refer that advice to whatever offices within the Agency and elsewhere he judges appropriate, secure Agency responses to the SAB that he can sign his name to, and take action.

Recommendation on SAB Requests for Response from the Administrator

The SAB should continue routinely to request that the Administrator provide timely, written responses to formally transmitted SAB advice.

Recommendation on Advising Nonheadquarters EPA Units Directly.

The SAB should consider advising the EPA Laboratory Directors or Regional Administrators directly, but only if this is requested by the EPA Administrator.

Recommendation on SAB—FIFRA SAP Coordination.

Every effort should be made to upgrade the coordination of the SAB with the FIFRA SAP on scientific principles, such as approaches to drawing inferences from experimental data.

Recommendations on SAB Agenda-Setting

- The various SAB committees should devote much more effort to scanning the horizon and setting their agendas—tasks, tactics, timing, resource and talent needs. On many issues the committees are much better positioned than the Executive Committee is to recognize emerging issues or anticipate difficulties.

- The Executive Committee, actively involving the standing-committee chairs, all of whom are Executive Committee members, should continually scrutinize the agenda of the Board as a whole so as to make the Board most responsive and most productive. It should consider engaging in more brainstorming, perhaps along with high Agency officials, to identify emerging issues that should be considered for the SAB agenda.

- The Agency itself should be urged to identify upcoming major Agency actions whose scientific aspects might warrant SAB attention, and more systematically sort out and express its priority preferences for the SAB agenda. The SAB agenda should continue to be negotiated between the Board and the Agency, with every effort made to focus on issues having the highest importance.

Recommendation on Criteria for Selection of SAB Projects

The Board should develop criteria like the following to guide selection of SAB projects. For instance, proposed SAB projects might be assigned precedence according to how intensively they will

- affect overall environmental protection;
- address novel scientific problems or principles;
- integrate science into Agency actions in new ways;
- influence long-term technological development;
- respond to emergencies;
- deal with problems that pervade several EPA domains;
- address problems that transcend federal-agency or other organizational boundaries;
- strengthen the Agency's basic capabilities:
- serve congressional or other leadership interests.

Recommendation on Improving Timing and Timeliness

Early in contemplated advisory exchanges, the relevant EPA offices and SAB committees should discuss the nature of the proposed advising; reach clear agreement on which aspects of the subject will be examined, and how; negotiate timing, interim reports and checks, deadlines, procedure, staffing, and documentation needs; and carefully husband and schedule the use of SAB talents and staff support.

Recommendation on Husbanding of Staff Efforts

Committee chairs and members should help budget and protect the SAB staff officers' time and efforts. Also they should encourage their committees' executive secretaries, as important parts of their jobs, actively to pursue liaison with the Agency program and other offices—to cultivate vigorous working relationships, discuss arising issues, negotiate expectations for reviews, and follow through on advice rendered.

Finding on SAB Staff Office Operations

The subcommittee finds, and has been urged by many Board members to emphasize, that the clerical and secretarial support services are very inadequate for handling the relentless SAB office workload of telephoning, planning meetings, arranging travel, reimbursing expenses, and preparing, revising, logging, reproducing, and distributing large volumes of documents. Clerical performance is not uniformly impressive (grade-level and salary limits may be a problem).

Many of the problems are the result of overload. In the past few years turnover in support staff has been high. The SAB offices chronically have had to work seriously shorthanded. These deficiencies have unduly held up preparation of Board reports and impeded other work.

Recommendation on Upgrading of SAB Office Computer Efficiency

The Board should encourage the SAB office to invest the infrastructural effort required to survey the capabilities of its computers and those available to the EPA, acquire the necessary software, set up mailing lists and tracking systems and document preparation systems, train all of the staff appropriately, and in general master and prepare to make the fullest use of computers.

Finding and Recommendation on the SAB Budget

The subcommittee believes that the present SAB budget is inadequate for the expectations, demands, and opportunities of the Board's work. The subcommittee strongly urges the Agency and the Congress to tend the SAB's budget as carefully as the budget of the Agency itself.

Appendix B—Office of Policy, Planning and Evaluation Program Evaluation Division SAB Reinvention—Main Messages from EPA Inverviewers

Overall Message:

The familiarity and experience of agency staff with the SAB is understandably quite diverse. Despite this diversity, the majority of the Agency managers and staff that the PED interviewed valued some aspect of the SAB. Additionally, certain common messages emerged from the variety regarding possible opportunities for reinventing SAB. Some of these are presented below. Additional issues, comments and themes (some of which were stated with considerable frequency) are presented in the full summary of interview data.

A. Agency interviewees believe there is too much involvement in policy questions/decisions by SAB members. Approximately three quarters of the interviewees indicated that it is not appropriate for SAB members to state positions on Agency regulatory decisions.

1. SAB's mission is to provide neutral science advice.
2. Regulatory policy involvement undermines the credibility and objectivity of the SAB.
3. SAB policy involvement undermines the agency's authority to make decisions in this arena.
4. SAB members are not public policy experts.

B. Interviewees frequently voiced concerns about the diversity of SAB membership, openness of the selection process and especially strong concerns about the potential for conflict of interest between serving the Agency as a member of the SAB and serving personal interests.

1. Concerns ranged from a general recognition of the potential for conflict of interest to specific concerns about individual SAB members.
2. Typical perceived conflicts: obtaining research funding; serving a private sector employer; serving another government agency.
3. Additional concern: no adequate mechanism exists to address this perception.

C. Agency managers and staff view SAB-initiated projects as a double-edged sword.

1. SAB self-initiation is a good check and balance system on agency science.
2. Agency managers and staff are leery of the SAB not having the time or resources to meet Agency requests due to competition from self-initiated projects.
3. Agency managers and staff are concerned about the practical problems posed by the unexpected resource drains/demands resulting from SAB self-initiated reviews.

D. Interviewees commented that gaps in SAB members' understanding of the Agency and the regulatory/statutory context for reviews reduces the utility of SAB recommendations and advice to the Agency.

1. Perception in the Agency that the SAB tends to be more academic and out of touch with the regulatory confines of the Agency.
2. Perceived lack of SAB appreciation for statutory and court-ordered deadlines; the frequent need to take action despite uncertain information.

E. Interviewees reported a lack of education/lack of communication to the Agency from the SAB on matters such as

1. The process for selecting members.
2. The process for selecting topics for review.
3. The clarification of mission and functions and how these can help the customer.
4. The preparation and expectations for briefing.

F. The process for delivering reports to the Agency often reported to be too slow and to not meet the Agency's needs.

1. There is too long a delay between final briefing and formal written report.
2. Oral comments at exit interview are helpful, but not uniformly received.

3. The SAB should state its recommendations more clearly, using less ambiguous language.

G. Interviewees noted the utility of early advice/consultation and a desire for more options for informal interaction.

1. Program offices find SAB input early in "product" development useful.

2. SAB as "stable of experts" to offer advice to agency.

3. Caution: those who advise should not also perform the review function.

H. Some managers and a number of Agency staff cited the lack of response by the Agency to SAB recommendations as a problem.

1. Resource investment in SAB reviews is high, often with little follow-up by the Agency.

2. Since the Agency is not obligated to follow the recommendations of the SAB, the response time from the Administrator is slow or at times nonexistent.

3. The Administrator's office needs to read and discuss the reports that come from the SAB and respond in a timely manner.

I. Many respondents (especially in ORD) expressed concern over the Agency's ever-increasing demand for peer review.

1. In some cases current needs for SAB advice and review are not being met and increasing future needs may overtax SAB.

2. Some program offices have a strong internal peer review process, but in other programs one does not exist.

J. Agency interviewees noted that the role of the SAB in relation to other science advisory bodies needs to be clarified.

1. What are the various science advisory bodies, what are their roles, and what, if any, coordination exists between them?

2. Who is at the helm guiding agency science?

Appendix C
Solicitation of Answers to Questions about the SAB

Self-assessment of knowledge of SAB and its activities on a scale of 1 to 10:

1. Perceived strengths and weaknesses

a. In your opinion, what are the greatest strengths of the SAB:

1) To the Agency

2) To the public

3) To a special constituency; e.g., the environmental community and the business community.

b. In your opinion, what are the greatest weaknesses of the SAB:

1) To the Agency

2) To the public

3) To a special constituency; e.g., the environmental community and the business community.

2. View of the SAB in 1989 Self-Study

a. In its 1989 self-study the SAB identified two principal missions:

1) An aiding-and-extending mission—e.g., providing a forum for discussion of technical issues in which the affected parties, the concerned public, Congress, Agency management, Agency staff, and other agencies can exchange views on technical matters.

2) An auditing-and-certifying mission—e.g., reviewing technical documents from the Agency.

Please comment on the appropriateness of these missions and their relative importance from your perspective. Also, suggest any additional missions(s) that you would like to see added to the SAB.

b. In its 1989 self-study the SAB identified six specific functions:

1) Reviewing the quality and relevance of particular regulatory science

2) Reviewing research programs

3) Reviewing the technical bases of various applied programs

4) Advising on infrastructural and technical management issues

5) Advising on short-notice problems

6) Advising on broad, strategic matters

Please comment on the appropriateness of these missions and their relative importance, from your perspective. Also, suggest any additional function(s) that you would like to see added to the SAB.

3. SAB Activities

a. Process for selecting issues for attention by the SAB.

The Board currently identifies the set of issues for attention through a negotiating process involving the Executive Committee, the individual committees, the Agency program offices, and the Administrator/Assistant Administrator's offices.

What are the strengths and weaknesses of the process and how could it be improved?

b. SAB involvement in "policy issues."

In recent years considerable attention has focused on the propriety of the SAB's getting involved in what some perceive as "policy issues." Some would cite the Board's *Reducing Risk* report on the comparison between different environmental risks as such an issue. Others would point to the unsolicited commentary from the Board that called the Administrator's attention to what they viewed as a disproportionate Agency response to the risk of radon gas in drinking water vs. the risk of radon gas in home basements.

Please comment on the extent to which the SAB should comment on policy implications of its technical findings. Try to illustrate your comment with examples of appropriate and inappropriate issues.

4. Timeliness

The Board currently provides advice to the Agency through formal reports that are approved by the Executive Committee and transmitted to the Administrator. This process is time-consuming—although, on average, less than 6 months passes between the last committee public meeting and transmittal of the final report to the Administrator.

Are there alternative routes, or even alternative modes of advice, that should be considered?

5. Membership

The current membership selection process involves public solicitation of nominees, coupled with targeted searches and discussions with key groups; e.g., SAB committees. The final selection is made by the Administrator.

What are the strengths and weaknesses of the process and how could it be improved?

6. Structure

The Board's ten committees evolved over time.

Clean Air Act Compliance Analysis Council (CAACAC)

Clean Air Scientific Advisory Committee (CASAC)

Drinking Water Committee (DWC)

Ecological Processes and Effects Committee (EPEC)

Environmental Economics Advisory Committee (EEAC)

Environmental Engineering Committee (EEC)

Environmental Health Committee (EHC)

Indoor Air Quality/Total Human Exposure Committee (IAQC)

Radiation Advisory Committee (RAC)

Research Strategic Advisory Committee (RSAC)

Some of them reflect Agency programs (e.g., CASAC and DWC); others cut across the Agency (e.g., EEAC and RSAC).

There are related technical advisory activities being carried out by other groups within EPA; e.g., the FIFRA Scientific Advisory Panel and the Biotechnology Scientific Advisory Committee.

Is there a better way to organize the Board and/or related groups to provide technical advice to the Agency more effectively and efficiently?

7. Agency- vs. Self-initiated Activity

Some people believe that the SAB serves the Agency best by being available to advise the Agency when asked to do so. Others maintain that the SAB serves the Agency best by actively examining issues on its own and providing unsolicited advice.

What mix of the two modes of action is best; e.g., 50%-50%, 10%-90%?

8. General Solicitation of Comment on the Board

In addition to responses to the questions above, the committee welcomes thoughtful comment on any and all aspects of the Board and how it might be reinvented to accomplish its purposes more efficiently and effectively.

Appendix D
Extra-Agency Interviewees

1. Political appointees

Erich Bretthauer
Former AA/ORD

Don Clay
Former AA/OPTS
Former AA/OAR
Former AA/OSWER

Terry Davies
Former AA/OPPE

Linda Fisher
Former AA/OPTS
Former AA/OPPE

John A. Moore
Former Acting Administrator
Former Deputy Administrator
Former AA/OPTS

William Ruckelshaus
Former Administrator

2. Business, Academic, and Environmental Communities

Dr. Theo Colburn
World Wildlife Fund

Dr. Rob Coppock
World Resources Institute

Dr. Michael Gough
Office of Technology Assessment

Dr. Robert J. Graham
Harvard School of Public Health

Mr. Peter Barton
Hutt Covington & Burling

Mr. William F. O'Keefe
American Petroleum Institute

Dr. I. Rosenthal
University of Pennsylvania

Dr. Terry Thoem
Conoco, Inc.

Ms. Victoria J. Tshinkel
Landers & Parsons

Dr. Ron White
America Lung Association

3. Representatives of Other Agencies

Dr. Barry Johnson
Agency for Toxic Substances
and Disease Registry

Appendix E
Draft Description of *ad hoc* Subcommittee to Develop Guidelines on Selection of SAB Projects

Mission

To develop precise, clear, and easy-to-implement criteria for selecting projects (i.e., full review, self initiated, commentaries, and consultations) for SAB review/advice. Factors such as timeliness, expected impacts crosscutting issues and added value to the Agency/public may be included in the criteria for selection of projects. Guidelines containing the identified criteria and how to use them for selection of SAB projects should be the end product to be delivered by this *ad hoc* committee. This committee should also develop recommendations as to who should choose projects using the guidelines (i.e., a permanent subcommittee, standing committees individually, Executive Committee) and when such choices should be made. Flexibility should be maintained.

Duration

This committee should complete its mission within a six-month period.

Composition

There should be two members from the Executive Committee, two to three members from the standing committees, and one member from the Office of the SAB.

Appendix F
Draft Position Paper on Science/Policy Interface

Science and policy are both multifaceted subjects, and in the context of the EPA's work they can interface in many ways, interpenetrating each other. While there is a "core" of each in which one is clearly recognized as "science" and the other as "policy," science and its use in the context of a regulatory agency is seldom free of policy implications, whereas policy, in the same context, often has scientific implications.

The SAB has traditionally tried to avoid deliberate entry into areas that clearly involve policy or policy making; on the occasions where this has been necessary, the SAB has been at pains to so note and to offer its reasons for doing so. The SAB has seen science (and technology) as its proper sphere, but, in recognition of the close relation between science and policy described earlier—and of the fact that, with advent of the EEAC, the work of the SAB has moved closer to core policy area—it is necessary to define the SAB's relation to policy.

The fact that science and policy usually influence each other should not deter the SAB from its basic mission. That mission is to ensure—to the best of the Board's collective knowledge and judgment—that the science conducted and used by the Agency is as well and as credibly conducted and used as it can be and that its uncertainties and alternatives are amply considered and addressed.

Commenting on important scientific disparities among policies, noting instances where science weakens or contradicts policy, commenting on cases where science has been badly used in formulating policy or in which policies may have adverse effects on the conduct or use of science are within the capabilities of the SAB and should fall within the bounds of the SAB's role. In these cases, the SAB should make clear what it is doing and why it is doing it.

In instances in which the SAB is specifically requested to provide policy suggestions or proposals by the Agency, the SAB, if it believes it can do justice to the request, can accede to the request, but this request must be clearly contained in the charge.

In no case should the SAB go into detail on the implementation of policy, although it can analyze and comment on the scientific support for, or the scientific implications of such implementation. Also, the SAB should not, gratuitously and on its own, propose or make policy or policy suggestions to the Agency.

Appendix G
Affiliation with the Science Advisory Board

1. Types of Participants: Members and Consultants

Members are nongovernment employees who serve on the SAB through appointment by the EPA Administrator, normally for a two-year term (renewable twice for a total of up to six years). Should a member be appointed to a two-year term as a committee chair, he/she may be reappointed to that post once.

Members are compensated for their time unless they elect to serve without compensation (WOC). Their travel and per diem expenses are paid.

Members are subject to conflict-of-interest laws (excepting representatives) and fill out all personnel paperwork.

Although the Board generally operates through consensus, only members may participate in any votes on an issue.

Technically, members may be special government employees (SGEs) or representatives (see below), although it is generally expected that an SAB member will serve as an SGE.

Consultants are nongovernment employees who serve on the SAB through appointment by the SAB staff director for a one-year term, renewable annually until such time that their expertise is no longer needed or they elect to terminate affiliation with the Board. Consultants do not serve as committee chairs.

Consultants are compensated for their time unless they elect to serve WOC. Their travel and per diem expenses are paid.

Consultants (excepting those serving as representatives) are subject to conflict-of-interest laws and fill out all personnel paperwork.

The Board generally operates through consensus, but in the event of a vote on an issue, consultants do not participate.

Technically, consultants may be SGEs or representatives (see below), although it is generally expected that an SAB member will serve as an SGE.

2. Status of M/Cs: SGEs and Representatives

SGEs are nonfederal government employees who enter intermittent federal service through a personnel appointment (initiated by SAB staff using an SF-52). They are normally compensated for their time unless they elect to serve WOC. Their travel and per diem expenses are paid. They are subject to conflict-of-interest laws, fill out all personnel paperwork, and are subject to certain post-employment restrictions after leaving the Board.

Representatives are nonfederal government employees who serve on the SAB, but whose economic interests cannot be fully separated from those of their employer. They are not compensated for their time, and travel and per diem expenses may be covered by either their employer or EPA. They are not subject to the financial disclosure or conflict-of-interest laws. They do not fill out any personnel paperwork. A representative is asked to serve on the SAB because a) the Board would likely benefit from hearing the technical views of the employee and/or b) his/her employer would not allow the individual to participate in any other way. In some instances, service as an SGE can limit subsequent activities of that expert in future dealing with the Agency on the matter.

3. Other Participants: Federal Liaisons, Invited Experts, and Invited Participants

Federal Liaisons are federal employees who are invited to participate in SAB reviews because of their particular expertise in or perspective on the technical issue being discussed. Their service is limited to the duration of the committee's consideration of that issue. They are not compensated for their time; however, travel and per diem expenses may be paid. An SF-52 is not processed and no paperwork other than a travel authorization is prepared in those cases in which SAB pays for the travel. They are subject to their own agency's conflict-of-interest regulations, which are comparable to EPA's. Consequently, they do not file a separate SF-450 (confidential financial form) with the SAB. However, they are expected to participate in the formal conflict-of-interest disclosure at the beginning of SAB meetings.

Invited Experts are individuals brought to a meeting at SAB expense to provide technical information and insights. They are not a part of the SAB panel and receive no compensation for their time. Therefore, they are not subject to paperwork

obligations beyond travel arrangements (invitational travel) and vouchers.

Invited Participants are individuals designated as SAB members or consultants whose appointment paperwork has not been completed. They are designated as such on the travel authorization and are reimbursed for travel expenses. However, they cannot be compensated for their time until the personnel action (SF-50) has been completed. They may not participate in the meeting unless their SF-450 (confidential financial form) has been completed.

Appendix H
Glossary of Terms and Acronyms

AAs	Assistant Administrators
ATSDR	Agency for Toxic Substances and Disease Registry
CAA	Clean Air Act
CAACAC	Clean Air Act Compliance Analysis Council
COM	Commentary
DFO	Designated Federal Official
DWC	Drinking Water Committee
EC	Executive Committee of the SAB
EEAC	Environmental Economics Advisory Committee
EEC	Environmental Engineering Committee
EPA	Environmental Protection Agency
EPEC	Environmental Processes and Effects Committee
ERDAA	Environmental Research and Development Authorization Act
ESEAC	Environmental Socioeconomic Advisory Committee
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FR	*Federal Register*
FY	Fiscal Year
IAQC	Indoor Air Quality/Total Human Exposure Committee
ISBN	International Standards of Book Numbers
MAF	Mission and Functioning
M&O	Mission and Organization
OGC	Office of General Counsel
OPPE	Office of Policy, Planning and Evaluation
OPPT	Office of Pollution Prevention and Toxics
OPPTS	Office of Prevention, Pesticides and Toxic Substances
OPTS	Office of Pesticides and Toxic Substances
ORD	Office of Research and Development
OSAB	Office of Science Advisory Board
OSWER	Office of Solid Waste and Emergency Response
PED	Program Evaluation Division
RAs	Regional Administrators

Glossary of Terms and Acronyms

RAC	Radiation Advisory Committee
RC	Reinvention Committee
RCRA	Resource Conservation and Recovery Act
RIA	Regulatory Input Analysis
RSAC	Research Strategies Advisory Committee
SAB	Science Advisory Board
SAP	Scientific Advisory Panel
SPC	Science Policy Council
TQM	Total Quality Management

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