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OS REGISTRY  
20 MAY 1988

19 MAY 1988

MEMORANDUM FOR: Deputy Director for Administration  
Deputy Director for Science & Technology

VIA: Director of Research & Development  
Director of Medical Services

FROM:   
Director of Security

SUBJECT: Polygraph Research Five-Year Plan

REFERENCE: Inspector General's 1987 Report on the  
Agency Polygraph Program

1. The referenced report recommends that a five-year polygraph research and funding plan be developed. The proposed plan, set forth below, is essentially an updated version of the polygraph research plan developed in 1986. This submission reflects two additional years planning, as well as the organizational changes which have taken place in the polygraph research arena over the past year. This plan requires resources of  and from  people per year for the next five years.

2. The structure of the polygraph research organization was altered substantially on 17 September 1987. A Polygraph Steering Committee (PSC) was formed which is accountable to the Chief, Polygraph Division (PD), the Polygraph Program Manager. The PSC oversees four newly formed working groups covering Instrumentation, Validity, Countermeasures and Methodology. The bulk of the polygraph research is being done under the auspices of one of these working groups. Polygraph Division's in-house research facility is conducting applied research, generally in support of one or more of the above working groups. The PSC is also advisory to the Polygraph Program Manager regarding polygraph research being sponsored by the Office of Research & Development (ORD). The Committee is informational to the Personnel Security Research Panel (PSRP) regarding milestones endorsed by the Polygraph Program Manager. The PSRP is advisory to the Director of Security.

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3. The following initiatives constitute the current activities of the Polygraph Research Program:

**INSTRUMENTATION WORKING GROUP** - This Group, with representation from the Office of Security/Polygraph Division (OS/PD), OS/Engineering Division (ED), OS/Research & Analysis Staff (RAS), ORD, and the Office of Medical Services (OMS), is chaired by the Chief, Information Systems Branch (INSB/ED). This group recently completed a program plan designed to produce a Modern Polygraph System (MPS). The Group has prepared the System Requirements specifications for an initial brassboard model which is expected to be available by May 1989. Evaluation and testing of this model will follow and lead to the production of engineering models of the MPS, Phase I. Enhancement to the MPS is planned in two additional phases over a five-year period with each phase providing greater utility and support to the polygrapher in performing an examination. Education and training regarding the MPS will parallel its development and incorporate expected feedback. The detailed Polygraph Instrumentation Program Plan (PIPP), including resource requirements, is attached. The Information Systems Branch will include a five-year projection in the Plan when it is published again in the second quarter of FY88.

25X1 INSB funding to support the MPS in FY88 is [ ] for  
 25X1 the production of an MPS Phase I brassboard and the  
 25X1 updating of the PIPP. In FY89, [ ] will be required for  
 25X1 the procurement of Phase I engineering models, evaluation  
 25X1 and testing of the Phase I hardware and software, the  
 25X1 preparation of further refinements to the MPS (Phase II and  
 25X1 III) requirements, the development of a Phase II brassboard  
 25X1 and updating the PIPP. FY90 funding of [ ] will include  
 25X1 Phase II evaluation and testing and the completion of  
 25X1 enhanced requirements to the MPS Phase III requirements and  
 25X1 updating the PIPP. FY91 funding of [ ] will include  
 25X1 tasks for the development and testing of special interfaces  
 25X1 and software for MPS Phase III, development of a portable  
 25X1 MPS, evaluation and testing of Phase III, support for MPS  
 25X1 Phase III procurement by Polygraph Division, and updating  
 25X1 the PIPP. FY92 funding of [ ] will include support to  
 25X1 Polygraph Division for the procurement and the installation  
 25X1 of Phase III, special modifications to the MPS software,  
 25X1 and the evaluation and testing of MPS Phase III. The  
 25X1 manpower to support the above tasks is three people for  
 each Fiscal Year.

25X1 OS/PD support of the above effort, including equipment  
 25X1 procurement and systems engineering and integration, will  
 25X1 require [ ] for FY88, [ ] each for FY89 & 90 and [ ]

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each for FY91 and 92. The procurement of the production model MPS will be funded through OS/PD at an anticipated cost of [ ] in FY91 and [ ] in FY92.

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**VALIDITY WORKING GROUP** - The Polygraph Validity Working Group (PVWG), chaired by a Research Psychologist from Research Branch, Research & Information Systems Division, OMS, was formed in September 1987. The PVWG consists of representatives from OMS, OS and ORD. The first major task of the working group is to develop a research methodology designed to assess the validity of the specific polygraph interviewing procedures now being used in the Agency. The target date for completion of this research plan is December 1988.

The research methods developed by this group will be specifically designed to investigate the issues related to the validity of the polygraph interview when used in the context of employment screening (i.e., applicant processing, trial, and reinvestigation polygraphs). Every effort will be made to develop procedures that take into account specific criticisms of past validation studies of the polygraph technique when used in the screening mode.

In FY89, the research proposals developed by the PVWG will be implemented. It is anticipated that as the results of these studies become available, new research plans will be developed and original proposals modified. Polygraph validation research in the Agency will be long-term, continuing and evolving.

Funding during FY89 will be for travel to meet with methodological experts in the public and private sectors. Additionally, we may wish to host interagency (CIA, DOD, NSA, FBI) meetings to coordinate validation research and to distribute the draft research proposal for external review.

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Total estimated funding for FY89 is [ ] Funding requirements beyond 1989 are difficult to estimate; however, they can be expected to equal or exceed the FY89 requirements. We anticipate that all research will be conducted within the Agency by individuals expert in research design and analysis. The particular Agency components responsible for executing this research have yet to be determined.

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**COUNTERMEASURES WORKING GROUP** - The Chief of the Polygraph Division Research Section has been designated to chair the Countermeasures Working Group. Funding was made available in FY87 for [ ] [ ] to assist in the development of a Counter-

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measures Research Program Plan. A two-day conference was held 7 and 8 December 1987, which was attended by experts within and outside of Government, for the purpose of identifying the issues and objectives that should be included in the plan. Individuals from within CIA will supplement the work of [ ] to address the unique aspects of the countermeasures threat posed by the operational cases conducted for the Directorate of Operations. The target date for completion of this research plan is December 1988.

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Funding resources in the amount of [ ] per year, beginning in FY89, are needed to fund countermeasures research. It is possible that the Countermeasures Research Program being developed will provide requirements for additional countermeasures research. This amount will allow one new countermeasures research initiative per year and also provide funding for one follow-on project per year. This level of funding should result in significant improvement in developing the ability to detect, counter and respond to countermeasures that will continually be directed at our operational testing program.

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**METHODOLOGY WORKING GROUP** - This Group, chaired by the Chief, Training Section, Polygraph School, PD/OS, was formed in November 1987. The Polygraph Steering Committee decided that methodology research could best be accomplished by participating in an interagency-directed effort supplemented by CIA-sponsored research for any unique requirements not addressed by the interagency effort. The Interagency Group is chaired by [redacted] Chief, Polygraph and Personnel Security, NSA. Other members include Dr. William Yankee and Dr. Gordon Barland from the Defense Polygraph Institute and the Chairmen of the CIA Countermeasures and Methodology Working Groups. No funding is anticipated for methodology research projects during FY88 and 89. Funding requirements for research in FY90, 91, and 92 are estimated to be [redacted] per year in order to accommodate methodology research in support of the Modern Polygraph System. Funding requirements will be greater if the majority of the research is not conducted within the Agency.

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4. The above working groups represent an organizational division of labor according to function. They are designed to address the basic research requirements of the Agency's polygraph program. Each of these working groups is dependent upon the goodwill and resources of the members' managers. The Working Groups, however, are supported by two additional offices with long-term specific charters to address polygraph research needs.

**OFFICE OF RESEARCH AND DEVELOPMENT** - The role of ORD in the Agency's polygraph research program has been primarily to investigate approaches and technologies 5 to 20 years in the future. Recently ORD has also assisted in developing the Modern Polygraph System Requirements, and continues to assist in drafting engineering requirements for that system. ORD will also help incorporate new measures [redacted] into the MPS. In addition, ORD will contribute in an advisory capacity in validity, countermeasures and methodology research.

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Currently, ORD sponsors four projects in support of polygraphy, with three other projects in planning:

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The current budget for ORD's polygraph research is [redacted] for FY88 and [redacted] per year for the next five years. (The bulk of the FY88 funds were spent on a study of advanced polygraph concepts; additional resources have not been required in FY88 due to delays incurred while waiting for Human Subject Review Board approval.) If all of the current projects are successful, these funds will prove inadequate. The Instrumentation Program Plan called for funding in the amounts of [redacted] for FY88-90, respectively. These figures represent what was thought to be necessary for continuation of all of the current research. Additionally, ORD is presently examining the possibility of increasing its support of the Instrumentation Program [redacted].

[redacted] The figures shown in the Funding Requirements attachment of this memorandum represent a preliminary projection of the funding needed

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for this increased effort, assuming that such an increase will not be possible until FY90. Equally critical to the success of the ORD effort is staffing. ORD currently has one person assigned to polygraph research. The increased effort will require one additional slot.

POLYGRAPH RESEARCH FACILITY - This facility will continue to engage in applied polygraph research. The research done here is intended to provide near-term support to the on-line examiner and ongoing support to the above working groups. Current near-term projects include:

Automation of Data Collection; [redacted]

[redacted] Computer Assisted Polygraph Validation; Automated Storage and Retrieval System for Polygraph Research Literature; and Development of a Laboratory Facility [redacted]

[redacted] Any prototype or methodology developed in any working group will be tested in this facility.

For FY88, [redacted] is necessary in order to fund additional equipment to complete the data automation system and to purchase software, supplies, maintenance contracts and reference books for a research library. It is estimated this amount can be reduced to [redacted] for each year from FY89 through FY92.

5. The funds and positions needed to accommodate the Polygraph Research program have been included in the program plans of ORD and OS/ED. Polygraph Division has programmed for the necessary positions to support this effort in FY89 and the necessary funding beginning in FY90. However, to meet the OS/PD agenda in FY88 and 89, internal Personnel Security program funds will be reprogrammed.

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6. The above five-year plan represents a coordinated effort on the part of OS, ORD and OMS to meet the Agency's future polygraph needs. The persons involved are making a substantial contribution toward this effort.

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ATTACHMENTS:

- A. Polygraph Research Funding Requirements
- B. Polygraph Research Project Schedule
- C. Polygraph Research Manpower Requirements
- D. Polygraph Instrumentation Program Plan

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SUBJECT: Polygraph Research Five-Year Plan

CONCUR:

\_\_\_\_\_  
Director of Research & Development

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Date

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Director of Medical Services

\_\_\_\_\_  
Date

APPROVED:

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Deputy Director for Administration

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Date

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Deputy Director for Science and Technology

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Date

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OS/PS/R&AS,  25 April 1988

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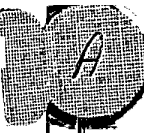
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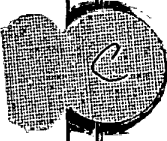


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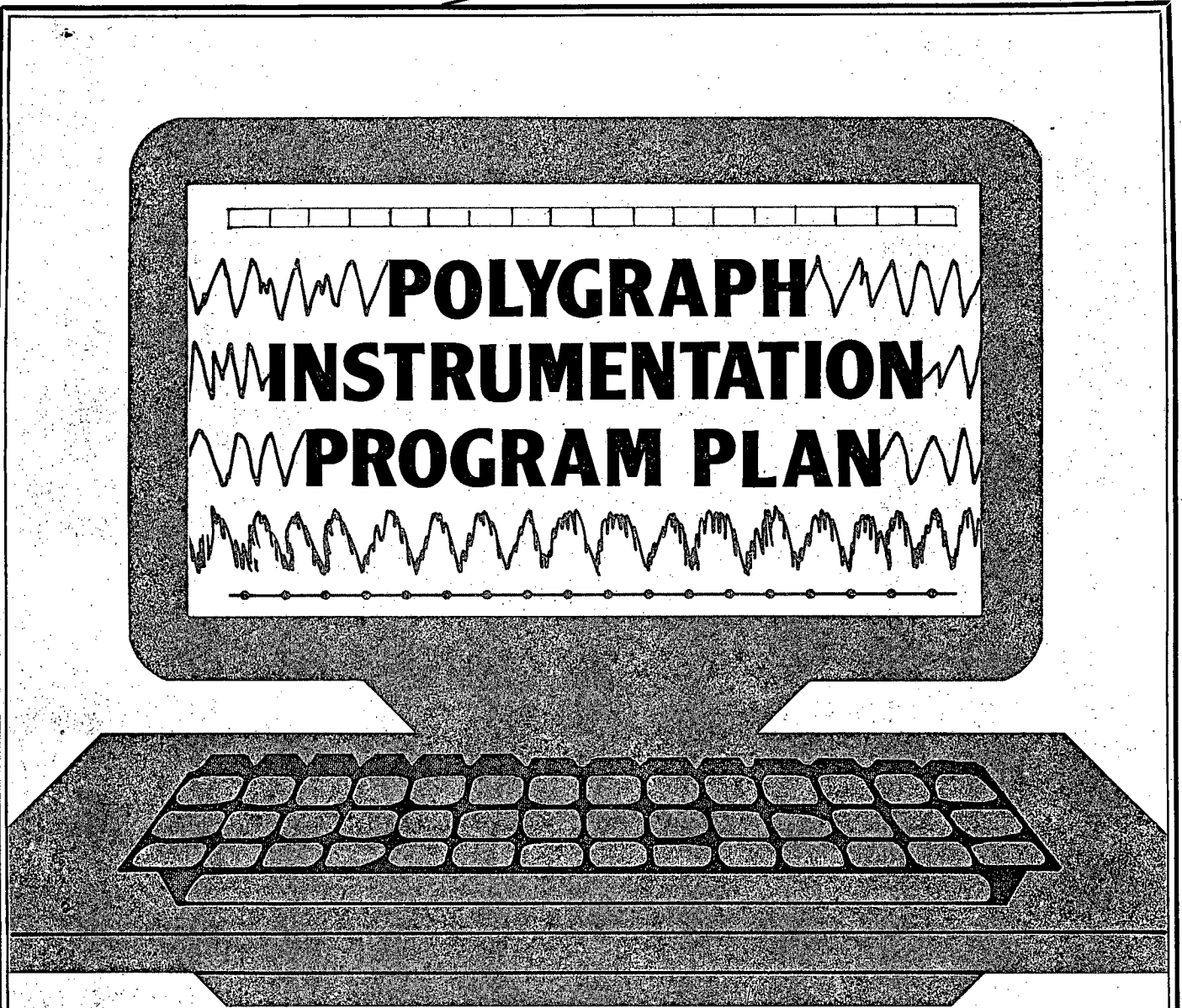


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**August 1987**



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POLYGRAPH INSTRUMENTATION PROGRAM PLAN

AUGUST 1987

Polygraph Instrumentation Working Group (PIWG) Membership:

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Office of Security -

Office of Research and Development -

Office of Medical Services -

Systems Engineering and Integration Contractor -

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## 1.0 EXECUTIVE SUMMARY

The Central Intelligence Agency has used polygraphy as an integral part of its personnel security program for nearly thirty years. During that period, polygraphy has repeatedly been scrutinized, both internally and externally (e.g., the Congress), in response to concerns expressed relative to its validity, methodologies, equipment, instrumentation, and susceptibility to countermeasures. Past efforts to enhance polygraphy instrumentation and validity have met with little success for a variety of reasons, some of which are: 1) attempting to incorporate modern technologies without a coherent transition strategy, 2) employing incomplete or poorly documented requirements, 3) lack of Agency-wide participation and knowledge which has generated fragmented results, 4) lack of a database of polygraphy results (both experimental and empirical) upon which to base a structured program, and 5) an understandable reticence to try new technologies and methods operationally without extensive test and evaluation. [REDACTED]

In recent months, an Agency Polygraph Instrumentation Working Group (PIWG) has met monthly to analyze the polygraph process, define issues of concern, and formulate a Program to enhance the Agency's polygraphy technology. The PIWG developed a Polygraph Issues paper in July 1987 and has since addressed these issues and corresponding comments from the PIWG members and contributors, which included the Office of Security's Engineering Division (OS/ED), Polygraph Division (OS/PD), and the Polygraph School (OS/PS); Office of Information Technology (OIT); Office of Medical Services (OMS); and Office of Research and Development (ORD), into this Polygraph Instrumentation Program Plan (PIPP). [REDACTED]

As shown in Figure 1, the PIWG recognizes four main areas of concern relative to current polygraphy. They are Instrumentation, Countermeasures, Validity, and Methodology. Each has its own requirements for enhancing polygraphy and each must be addressed distinctly, but not independently. Instrumentation, for example, must provide optimal data upon which to base Validity research and prototyping. Final conclusions relating to Validity issues may in turn dictate new sensor instrumentation requirements or polygrapher evaluation criteria (i.e., impact on Methodologies). Interaction between these four main areas of concern highlights a requirement for an organization (i.e., Program Office) to coordinate them just as the PIWG has coordinated Instrumentation in the past months. This coordinating body should generate a Polygraph Program Plan addressing the interaction of the four subordinate

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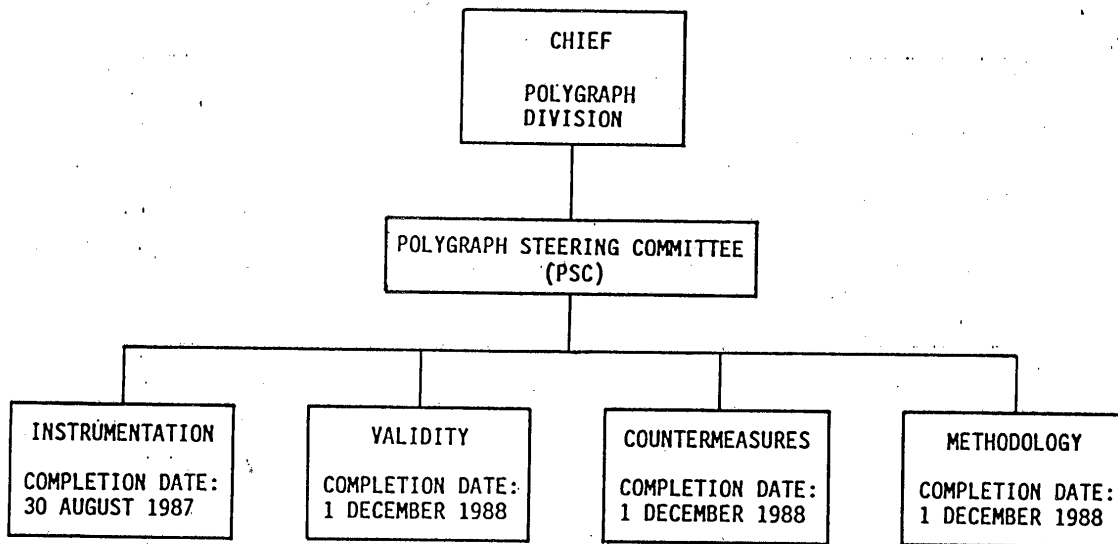


FIGURE 1 MAJOR POLYGRAPH AREAS OF CONCERN

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25X1 Program Plans for Instrumentation, Countermeasures, Validity, and Methodologies. Figure 1 also indicates milestones for completion of the individual Program Plans. [redacted]

25X1 The development of this Instrumentation Program Plan as the first step toward enhanced polygraphy is neither accidental nor inappropriate, but should not be misinterpreted as diminishing the importance of the other three concerns. Instrumentation is an area that can be significantly improved at low risk in a reasonably short length of time and at a moderate cost. The pay-off is immediate: in addition to enhancing operational polygraphy, better instrumentation can improve data gathering, storage, and analysis in support of the other three areas of concern. Also, Research Database requirements should be tailored to the capabilities of optimal, accurate instrumentation vice those of the older equipments. Establishment of a Research Database as a critical initial Program element was a specific recommendation of the Agency IG (reference Appendix A). [redacted]

25X1 The Polygraph Instrumentation Program Plan, detailed in Chapter 5, is composed of six distinct tasks. These tasks were developed to address the eight major issues identified by the PIWG which are summarized in Chapter 4. The six Program tasks are: 1) Program Planning and Analysis, 2) Research, 3) Prototyping, 4) Modern Polygraph System Development, 5) Education and Training, and 6) Polygraph Focal Point. Each task, the roles and responsibilities of Agency components, the risk/pay-off for performance, resources required, and milestones are specified in Chapters 5, 6, and 7. Although this Plan recognizes the support which Instrumentation provides to enhancing Validity, counteracting Countermeasures, and optimizing polygraph Methodologies, it does not specifically address the solution of these complex concerns. The Program Master Schedule, Figure 7, indicates only when the additional Program Plans must be developed if the Instrumentation Program is to retain its momentum and not be adversely delayed. [redacted]

25X1 This Program Plan covers a three year period: FY1988, FY1989, and FY1990. It is planned that this Program Plan will be revisited each year and the planning period extended accordingly. [redacted]

25X1 The execution of this Instrumentation Plan will provide one operational brassboard of a Modern Polygraph System (MPS) by 31 December 1988. It will also provide ten engineering development models of the MPS by 30 June 1989 for training and operational evaluation. Finally, in addition to providing

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support for Validity, Countermeasure, and Methodology research, the Plan develops tools for training and education. [redacted]

Plan execution requires approximately [redacted] (equivalent full-time) Government personnel. During this three year period, the Plan projects a requirement of [redacted] for development in the Instrumentation area. Major fiscal requirements are on the order of [redacted] per year for contractor support, [redacted] per year for research, and [redacted] per year for equipment procurement. Small amounts of O&M funds are also required. [redacted]

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In summary, this Polygraphy Instrumentation Program Plan provides the guidance to satisfy Instrumentation needs in both the short and long term. It addresses Instrumentation planning, guides new research, provides a prototyping environment for proof-of-concept testing, and incorporates empirical results into the development of a Modern Polygraph System. This system serves operational polygraphy as well as providing training and career enhancement tools and techniques for polygraphers. Finally, the Plan identifies a Focal Point which serves to consolidate, correlate, and disseminate polygraphy information on an Agency-wide basis. [redacted]

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