APPENDIX E

Appendix E

Responses to Questions on Definition of Management Information Needs and Reassessment of the MIS

This appendix essentially summarizes the responses, as received, to questions posed to the Groups and Staff and the results of discussions carried out during the course of the study.

The Groups, Staff, and PMB were asked to respond to two distinct sets of questions; the first dealt with the current MIS and the second with management information needs.[1] Unfortunately, the responses were in some cases not as specific as might have been desired, undoubtedly due in great part to the short deadline for the project, but it was felt that enough good information was provided and that a re-do for purposes of this study was not required. In addition, a survey on usage of the MIS, conducted by PSG/AID toward the end of the last calendar year, provided some added insights into the problem, as did discussions with IAS concerning its usage of, opinions about, and desires for the MIS. Although the problem must be viewed in its entirety and there is a certain amount of overlap in that which follows, for convenience this appendix is subdivided into four sections: Costs; MIS Input Accuracy; MIS Output, and Management Information Needs.

Costs

With respect to current costs, it was felt that dollar values provided the best, most comprehensive common denominator, although certainly man-hours and machine time are relevant statistics and have been included where feasible. Replies to specific questions about costs were received in most cases from the Groups and Staff; approximate costs were inferred where necessary and translated into dollar equivalents. For example, man-hour costs for time sheet preparation, input/output activities, and MIS coordination were converted using the dollar values found in the MIS Handbook; where specific grades were known the figures were converted directly and, in other cases, the average NPIC grade of [redacted] dollars per hour was used. 25X1

For this study, overly detailed costs are not necessary, nor were they feasible to obtain in the time period allotted. Such detailed costs would be required only in the highly unlikely event that two or more effective alternatives were so identical in all aspects that the

1. See Appendices A and B.

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ultimate decision would be based solely upon incremental dollar values. The premise is that management needs certain information, and there are a number of ways in which it can be provided. Once legitimate needs are established and prioritized or defined at a certain level, within the constraints of available and justifiable expenditures, only what amounts to an ordinal ranking of feasible alternatives, those which meet the requirements within the constraints, is needed. That is, the system objectives can be accomplished within the constraints with system alternatives A, B, and C and not D or E; therefore choose alternative B because it does the job and is less costly than A or C. It is not necessary to say how much less, that is, to know the precise costs, but only to say that the ranking according to costs from highest to lowest is A, C, and B. (Of course, at least conceptually alternative B might be a significantly or totally manual system.) Some other reasons, among many, for not including precise costs are that MIS costs can vary from period-to-period, that is, they are not standard so certain assumptions must be made; hardware costs are to a great extent sunk costs making the only relevant measures functions of available machine time and/or work precluded by the MIS or other systems; estimates of man-hour costs for a totally or significantly manual system would indeed be very rough estimates since they must be predicated upon the system configuration which, of course, does not now exist, and it is most difficult (again, particularly in view of the time frame for the study) to impute a dollar value to management information, particularly in this non-profit environment.

If purchased, computer time for the MIS would cost about [redacted] per year at the current rate [redacted] Keypunch time is about 56 hours per week at an average salary of [redacted] per year. The AID functions of input/output/maintenance/dissemination cost about [redacted] annually, and the cost of filling out time sheets in AID is estimated to be about [redacted] The PSG/R&RD annual costs are about [redacted] for time sheets and [redacted] for I/O. TSSG annual costs are estimated to be [redacted] for time sheets and [redacted] for I/O activities. IEG annual costs are about [redacted] for time sheets (includes DIA) and [redacted] for I/O activities. O/DIR and PPB Staff annual costs are about [redacted] for both time sheets and I/O activities. The total annual cost more or less directly attributable to the MIS then is about [redacted] it is felt that this is probably a very conservative estimate. For obvious reasons, IAS input time has not been included in this figure. Or looking at it in another way, less computer costs, the Center expends about 12 [redacted]

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(NPIC average grade) man-years on the MIS. The original cost of analysis and programming, both in-house and contractual, was not available; however, the contractual effort by Lockheed amounted to at least six man-years and the total NPIC contribution was at least double that.

MIS Input Accuracy

Concerning input accuracy, which is at least a function of the structure or procedures of the system, the emphasis placed by management upon the system, and the care with which input data is verified for accuracy, TSSG commented that time sheet accuracy for the Group ranged from "meticulous to meaningless." It further commented:

> "The time of those employees primarily engaged in direct project work is fairly well recorded. But much of the Group's resources is expended against general overhead, and time is recorded rather casually. Probably the greatest detriments to accurate time charging, where accuracy is aspired to, are the practices of filling out time sheets weekly--so that many details are forgotten--and the complexities engendered by the multiplicity of project numbers and activity codes. Overall, the major factor behind poor reporting is lack of incentive. This is the same problem widely recognized and often discussed in terms of lack of understanding regarding the System's capability and utility."

PSG comments with respect to input accuracy can be summarized as follows: AID, estimates a 95% level of accuracy; R&RD, the physical recording of project numbers, activity codes, hours, component, name, etc., are entered with about 85% accuracy; RD, accuracy is as good as a quick check permits. R&RD elaborated upon the accuracy subject, saying essentially that, despite a conscientious effort, as a service organization many of its activities do not fit easily into the MIS format; for example, project numbers furnished to the Division must be verified for accuracy but project listings are usually out-of-date, the Division often supports very current projects or "pre-requirements" which are rejected by the computer, people often forget project numbers when requesting service and priority requests cannot be denied for lack of a number, etc. RD added that most inaccuracies occur as a

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result of transposed numbers; incorrect splits assigned by originating components; inadvertent dropping of legitimate splits; flagrant misuse of continuing project numbers, and a lack of understanding on the part of the individual employees of both the functioning of the System and its purposes.

The PPB Staff and the PMB expressed concern about the accuracy and, in certain cases, lack of input data, reflecting at perhaps a more aggregated level the concerns of the Groups as pointed out above. IEG categorized MIS input as "not accurate".

MIS Output

Questions were asked the Groups and Staff concerning MIS output, the uses to which it is put, its timeliness, and additional desired reports.

TSSG receives the following listings: active projects; component time allocation; cancelled projects; completed projects, and active projects by component. It commented that these are "...low-level management tools to keep track of active projects and employee activity." During the previous year, TSSG also requested two special listings for costing studies. It recommended that, if the MIS is retained, management be given instructions in its usage.

With respect to output, PSG/AID components receive the following listings: active projects (two copies); component time allocation (two copies); active projects by component (two copies); completed projects (two copies); cancelled projects (two copies); and incorrect input (one copy). It commented that actual usage of these listings varies by component; however, most components agreed that the information generally is not timely enough and that there are too many project numbers and activity codes. A certain amount of non-routine output has been requested by AID for special studies, and an additional regular report giving computer utilization time for peripheral equipment would be useful.

PSG/R&RD Branch Chiefs routinely receive the component time allocation and active project listings; the Division office receives the above plus Options 1, 3, 5, 7, and 10. Certain special requests for output have been levied by the Division in the past. The active project listing is used to monitor projects and check the validity of project numbers.

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Component time allocation is used to assess the activities of Division employees. The other options are used mainly to compile monthly running totals of regular and overtime activities by project block. These totals are portrayed graphically, hopefully to reveal significant trends showing production gaps, slippages, or deficient reporting methods. PSG/R&RD commented that statistical information derived from MIS output is used in the budget cycle and for special reports, but the inaccuracy of MIS information "...may lead to false conclusions, particularly regarding the various support activities of R&RD. This has occurred several times in the past because of the inability to relate, in any meaningful way, projects to activities to products and finally to man-hours consumed. Our records have been kept manually and are accurate, but they are not as acceptable to top management as an inaccurate machine run."

PSG/RD receives the following listings: active projects; component time by project and activity; incorrect input; completed projects, and PMB scheduling listings. Each RD component now uses these listings for various purposes, but with the exception of the active project listing and the PMB scheduling report, the information is mostly historical and is used only for predictive purposes. RD added, "The information never seems to be timely enough to answer questions regarding project costs, overhead, or activity breakdowns. This is not necessarily a fault of the MIS but rather the fact that the information seems always to be needed by top management before it is actually available. Cost data has been requested on an ad hoc basis in the past but could not be interpreted correctly because of insufficient information in the MIS record." RD feels that an additional, timely PMB listing for purposes of project estimating and scheduling is needed and that the value of the MIS could be enhanced if a "reorientation" of individual employees toward the MIS were made available.

IEG "conducted a thorough review" of the MIS and found "its use limited because of its very narrow reporting spectrum." The Group called for "an expanded MIS system," saying that "Whenever staff papers, budget reviews, yearly summations, etc., must be prepared, IEG must compile its statistics through manual methods and finds these methods leave much to be desired." The output desired by IEG is covered below under the discussion of management information needs.

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The PPB Staff has certain routine output requirements in order to accomplish its functions (e.g.; situation reporting, COMIREX quarterly report, budget cycle documentation, etc.), and it must answer a number of ad hoc requests based, at least in part, upon MIS data, ranging from in-depth analytic studies to brief responses to specific one-shot questions posed by the O/DIR. You are quite familiar with the scope and content of this work, so the details have not been included. Specifically with respect to MIS output, the PPB Staff feels the inaccuracies of input are also applicable to output, the levels of retrieval are clumsy, skill/activity codes are poor, weekly reports need revision, timeliness is not adequate, product reporting is next to worthless, the DIA/CIA time reporting problem needs resolution, the category codes are obsolete, there is useless information in the system while, on the other hand, there are very significant information gaps; in short, the entire system needs attention, including revision and/or eventual replacement and the solid backing of all levels of NPIC management and supervision.

The PMB finds the MIS impractical for its uses. A special report format incorporating the desires of the PMB was written by [redacted] 25X1 of the PPBS; however, the PMB still finds its information re- 25X1 quirements unsatisfied and now recommends one of two alternative reporting systems, one being a real-time reporting system and the other being a graphic approach to forecasting showing estimated and scheduled man-hours versus projected on-hand strengths.

IAS makes positive use of the MIS and can cite examples of decisions based upon MIS data. Specifically, IAS uses MIS data in combination with a manual system, where applicable, to generate the following standard reports: Five-Year Plan of the Imagery Analysis Service; Summary of IAS Workload (Monthly); New Projects in Work for Period---(Weekly); and Charts (Quarterly and Yearly) showing IAS Division of Labor (PI time) by consumers, geographic area, and subject. IAS obviously has a good deal of confidence in the IAS portion of the MIS output, and it is used by IAS top management. However, this was not accomplished without effort; the Service spent considerable effort on tightening up the system, particularly the activity codes and project establishment, and conscientiously validates input. In IAS, the top management requirement that data input be accurate has been and is explicitly made known. (This is not universally true within the Center.)

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It was mentioned that, at the close of the last calendar year, PSG/AID ran a survey on the "Usefulness of Standard Management Information System (MIS) Reports." At the time, 17 standardized reports were available, 10 on a regular basis and seven on an ad hoc basis. Respondents were asked to categorize reports according to "Presently Useful, No Present Need, Would Like to Receive, and Did Not Know Report Existed." Replies were received from all the Groups, the PPB Staff, and IAS; specifically, of the 69 NPIC organizational elements listed in the MIS Handbook, 39 replied, including a significant portion of the substantive components. In this sample, of the 17 reports available to each of the 40 potential users, responses were received indicating that the reports were of use in 30.1% of the cases. That is, of the sample space of 680 (40 components X 17 reports = 680), only 30.1% of the replies indicated a report to be either "Presently Useful" or "Would Like to Receive"; 69.9% of the answers indicated the report to be of no use. Similarly, of those 10 reports regularly available, 35.8% of the responses indicated a use for the report, and 64.2% indicated no use, and of the seven ad hoc reports not regularly disseminated, 16.9% indicated a use for the report and 83.1% indicated no use.

Management Information Needs

With respect to management information needs, IEG expressed a desire that the following data elements be included in the MIS:

1. Target information -- Number by mission, collection system, and geographic area, completed weekly, monthly, and yearly; number added and deleted weekly; number by country, reporting phase, mission; number in each basic report category and completed quarterly and yearly; number of NAC and IDO by mission and system, monthly and yearly; on a real-time basis, number to be read out on each mission and IEG progress in completing readout.

2. Publications -- Number by type, monthly and yearly; number of pages by report type, monthly and yearly; number of graphics by type, monthly and yearly.

3. Briefing Boards -- Number by mission, system, and geographic area monthly and yearly; special boards by type, monthly and yearly.

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4. Monthly First- and Second-phase Statistical Report -- Number of targets by country and reporting phase, and target counts by mission as the exploitation and reporting are completed.

5. Processing -- Weekly total of units received in PCS/IEG categorized by processed, forwarded, and pending; weekly total of briefings conducted with preparation and presentation time.

6. Visitors -- Number of visitors and time spent on tours, briefings, etc., monthly and yearly.

7. Scheduling -- Plan for a real-time system to show progress toward completion of estimated level-of-effort to complete a given project with daily output showing, for example, First-, Second-, and Third-phase project time, briefing time, leave, training, etc., by section, branch, division; that is, daily information available to managers and supervisors each morning to help them direct or reassess the effectiveness of their operation. The computer could provide machine runs to show, for example, a week or month ahead, the time needed to accomplish First-, Second-, and Third-phase reporting and other tasks, such as briefings.

8. Aircraft Missions -- Number by type of mission, footage, and geographic area, received and completed daily, weekly, monthly and yearly.

IEG added that, if current on a daily basis, the MIS would be a main production control tool and cited an existing example of such a system (ACIC, St.Louis). Such a capability would allow management to adjust schedules in time to avoid production problems. IEG concluded, "Until the system goes on a more real-time basis, the information that is entered is not accurate because the average NPIC employee only fills out his time sheet once a week and this creates errors, thereby making the system ineffective except for general studies to show trends or historical information."

PSG/AID, in considering management information needs, cited that it now uses certain routine MIS outputs (active project list, component time use, active projects by component, projects completed, cancelled projects, and incorrect input notices) for the purpose of determining

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if the MIS is current and to verify projects/requests levied on the component. Three AID Branches were mentioned as having requested special runs for time studies on particular projects. The Division commented that, with the exception of the active project listings and certain ad hoc output, it feels the MIS information is not current enough. It concluded, "In the case of AID, it is essential that management knows at any given time its manpower and machine allocation. This is important in the scheduling of tasks according to priority with the capability of handling crisis-type projects upon demand."

PSG/RD regularly receives those reports listed previously, plus time reports on specific projects on an ad hoc basis and the PMB estimating and scheduling listings. There uses are chiefly as a historical record for project costing, as a basis for future personnel strength and/or overtime requests, and as a reference tool to maintain the accuracy of individual time sheets. The PMB runs are used to determine project status, to improve estimating and scheduling methods, and to provide a record of committed time by activity versus available time. The Division stated, "With the exception of the active project listing and ad hoc requests for total time to date for specific projects, the available MIS information is of little use to RD personnel. All of the MIS statistics can obviously be put to some use but, as far as the various options are concerned, one system of reporting time charged by project, component, and activity should be sufficient for all." RD expressed the hope that, through the PMB vehicle, eventually all of those projects that can be estimated and scheduled will be, so that "we can then deal with the ad hoc, non-scheduled, almost daily crash projects, such as PSG/RD support to the CIA budget and to NRO," the immediate goal being "...to have the capability to manage our seemingly endless crises more purposefully." RD closed by offering a concept of future operation of an MIS: "The ultimate in availability of MIS-type information should be built into the future IIS. A manager, sitting at a console, should be able to determine the status of any project at any time merely by flicking a switch. The idea, in any event, is to obtain essential information regarding production planning and management on a near real-time basis."

PSG/R&RD uses both manual systems and the MIS to compile statistics mainly relative to products and requests processed by month. The MIS has no capability for clocking processed requests or backlogged material,

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and certain statistical information is maintained manually for compilation of monthly reports. In view of the above and the MIS output utilized, as mentioned previously, R&RD comments, "Because of the basic structure of the MIS and the difficulty the Division has in participating in it, most of the information derived from the system is of little value. For our purposes, it is an inaccurate and inadequate picture of our activities because the basic data put into it is distorted in order to conform to the pattern set. We use time sheet data to match with statistical information kept manually in order to arrive at an average figure for processing materials or answering research and reference questions. But with the known inaccuracies of input, the resulting inaccuracies cannot be considered as anything more than an estimate. Much of the information contained in the various option runs reveals only that an individual is performing the duties for which he was hired." The Division stated that it needs basically the kind of data it now compiles manually, and often on an immediate basis, specifically, numbers and originators of requests for services; types and numbers of materials processed, on hand, and disseminated; regular and overtime allocations to these activities; a print format to relate time, product, activity, and requester, and information on the inter-relationships of projects among various responsible components. It would like to have the capability for on-line display or printed graphical forms of this information. R&RD summarized by saying that management information is needed by the Division to give an accurate picture of its overall services to the Center; to identify the chief users of Division facilities; to develop service time statistics; to develop trend information so appropriate actions can be taken; to plan for the future; to provide standards for comparison with similar facilities in other organizations, and to provide higher management with the information it needs for planning.

In responding to the questions on management information needs, TSSG noted that the Group, aside from SSD, has only a few formal systems for obtaining and maintaining information. This is a function perhaps of the facts that the Group is small in size, is charged with activities of a radically diverse nature, and has some strict compartmentalization because of security, all of which encourages many person-to-person information exchanges. Also, the Support Services is regulated by DDS procedures and has what is tantamount to a separate information system. Aside from records kept for DDS activities, the main TSSG information files concern personnel and project status. These files may be largely overlapping

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and redundant, but they are manual, rudimentary means of keeping managers aware of where their employees are and what they are doing, what tasks are pending, and whether deadlines and cost estimates are being met. TSSG commented that, for all intents and purposes, "...the people in this Group do not use the MIS. Furthermore, most managers have only vague notions about the System's capabilities." The Group suggested that a "NPIC Data Center," keeping both manual and machine records, might answer some Center problems and obviate duplicate files to a certain extent. The stated TSSG managerial information needs are:

1. New Collection System Data -- For Planning R&D Programs and Center operations.

2. Higher Management Policies and Objectives -- A self-evident need, but one which some managers feel is often overlooked.

3. Status of Projects -- In TSSG, emphasis is placed upon ascertaining and documenting the status of R&D projects. Each manager must have available certain project information; although some smaller components tend to rely on memory for the information, the most orderly and efficient keep some written records regardless of size.

4. Contractor Standards and Performance -- Currently, this need is met by information recorded mainly in individual project files; such a file should be part of the Agency-wide systems being developed by DD/S&T and O/L.

5. File of Technical Specifications -- A library of "boiler-plate" papers giving routine passages in development objectives and specifications.

6. NPIC Equipment Inventories -- An inventory with consistent terminology giving items on hand, age, condition, maintenance requirements, and technical specifications such as size, weight, and power needs.

7. Mission Schedules -- Size, type, and date of anticipated input.

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8. Personnel Locator and Attendance Records -- The need is well established,and being met, but not efficiently since many duplicative files exist.

The specific needs of the PMB were mentioned under the Output section; essentially, this comprises near real-time reporting of availability and utilization of resources versus on-hand and estimated requirements and other valid tasks. Obviously, this is both an accounting and forecasting function. PPB/RAD now accurately forecasts satellite mission processing man-hour requirements, based upon numbers of targets, for the PMB using MIS data. In addition, the PMB is moving toward better forecasting for the other NTP categories or whatever meaningful breakdown of Center activities is devised in the future. The PMB needs data in a timely fashion to greatly improve both the accounting and forecasting capabilities.

The needs of the PPB Staff can be divided into routine and special or non-routine. The routine needs are the data and properly formatted output relevant to the budgeting cycle and the five-year planning and programming effort and the data to keep the O/DIR and other legitimate authority adequately informed concerning operations, current and future. Although these may appear to be rather straightforward requirements, they are complex endeavors which require accurate measurement and reporting of resources and their uses, classified at least three ways (dollars, human resources, and materiel resources) with a crosswalk capability, meaningful assessments of the future environment and its demands upon and resource implications for the Center, and policy and plans to meet these future requirements, expressed in appropriate units of resources required. The non-routine or special needs are more difficult to assess, which implies a significant degree of flexibility in the data base and the system with respect to content and input and output. However, certain data needs can be foreseen and incorporated in the system with the assurance that the expense will be less than the benefits to be derived; other needs must be carefully weighed, cost versus benefit, before they are routinely incorporated. And one other capability, not now present in the MIS, is that the results of certain significant special studies, including the data generated, must be incorporated in the system.

It is also worth mention that, to a greater or lesser extent, within the Groups certain scheduling and production controlmechanisms exist.

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If their existence is justified by efficient performance of essential tasks, even given new or greatly improved system capabilities, then the system should serve these activities where, from a system viewpoint, it is efficient to do so.

As was pointed out, the IAS now uses the MIS and does not want to see it discontinued. However, the Service is in favor of improved capabilities, to be accomplished either through the current System or through a new system. It can be stated with assurance, for example, that it would be in favor of and willing to participate to a reasonable degree in the design and implementation of a new system and/or redesign of the current System were the benefits projected to be worthwhile to the Service.

APPENDIX F. Samples of MIS Standard Output

This appendix includes samples of the MIS Standard Output, except for Option 7, a copy of which was not available. Option 7 shows regular time, overtime, and equivalent dollars by Branch, Activity, and Project Number.