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DOE ASSESSMENT GUIDE FOR SAFEGUARDS AND SECURITY

May 1978

Prepared for

U.S. DEPARTMENT OF ENERGY
Assistant Secretary for Defense Programs
Office of Safeguards and Security

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ASSESSMENT GUIDE FOR SAFEGUARDS AND SECURITY

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April 1978

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PREFACE

This guide was prepared by staff of Battelle Northwest at the Human Affairs Research Center and the Pacific Northwest Laboratory in collaboration with the staff of Safeguards and Security of the Department of Energy. The work was performed under contract E45-1-1830.

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ASSESSMENT GUIDE

1.0 INTRODUCTION

The Office of Safeguards and Security fulfills its mission of safeguarding DOE materials, facilities, equipment, and property through the operation of programs designed to:

- Deter malevolent acts involving nuclear materials or facilities; to minimize the possibility of successful completion of those acts, and, to minimize the consequences of such acts if perpetrated;
- Protect classified information and material from unauthorized disclosure; and
- Protect DOE property from theft or malevolence.

Headquarters, Office of Safeguards and Security, initiates programs which:

- Develop, test, and evaluate systems and technology designed to account for and protect SNM, DOE classified data, facilities, and other property from acts of theft, sabotage, and vandalism, as perceived as the result of theft analysis in close coordination with ongoing efforts in other government departments and agencies.
- Assure timely transfer of accounting and protection technology to the private sector and to the International Community.
- Support the Nation's nuclear nonproliferation policies.
- Provide technical support.

DOE operations are periodically assessed to assure that special nuclear material, restricted data, and other classified information and DOE facilities are executed toward continuing the effectiveness of the International Atomic Energy Agency safeguards.

2.0 PURPOSE AND SCOPE

The purpose of this guide is to describe the philosophy and mechanisms through which these assessments are conducted.

The assessment program described in this guide is concerned with all contractor, field office, and Headquarters activities which are designed to assure that safeguards and security objectives are reached by contractors at DOE facilities and operations. Some clarifications of the scope are:

(1) SS has assessment responsibility only for DOE facilities, but has responsibility for basic research and development on safeguards and security systems for all applications (e.g., contractor, licensee, and international).

(2) Certain activities of SS serve some DOE functions in areas other than safeguards such as nuclear materials management. Other agencies are served in these areas as well. NRC and DOD are two examples.

(3) Relative to classified information the primary responsibility applies to restricted data, and it extends to: (a) protection of other classified information received and stored by DOE facilities; and (b) assuring that DOE-restricted data are not transferred to outside facilities unless adequate storage and handling facilities exist.

Headquarters' Assessment Branch responsibility includes provision of technical support concerning the determination of the adequacy of physical protection measures in other countries as a condition for nuclear export and certain aspects of bilateral safeguards.

This guide takes into account the interlocking relationship between many of the elements of an effective safeguards and security program. Personnel clearance programs are a part of protecting classified information as well as nuclear materials. Barriers that prevent or limit access may contribute to preventing theft of government property as well as protecting against sabotage. Procedures for control and surveillance need to be integrated with both information systems and procedures for mass balance accounting. Wherever possible, assessment procedures have been designed to perform integrated inspection, evaluation, and follow-up for the safeguards and security program.

3.0 BASIC ASSESSMENT APPROACHES

3.1 ASSESSMENT OBJECTIVES

The objective of assessment is to provide management at all levels with the necessary assurance that the safeguards and security program is functioning as intended. It is part of the measurement of performance needed in all management processes.

3.1.1 Functions of the Assessment Program

The assessment program must provide a basis for both the defense of program adequacy and the determination of required changes and corrective actions. This dual responsibility for (1) the determination of program status and (2) feedback to other program elements is indicated in Figure 1, which shows the relationship of assessment to the other elements of the safeguards and security program. Assessment is required with respect to both design and implementation.

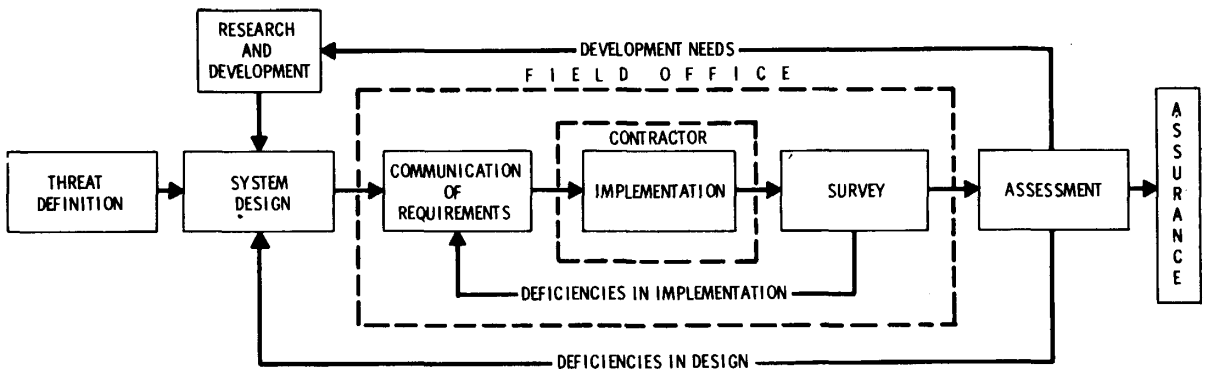

FIGURE 1. Elements of Safeguards and Security Program

3.1.2 Types of Performance

As part of the basic assessment approach two different aspects of performance need to be distinguished. These are: (1) the integrity of the performance and (2) the effectiveness of the performance.

3.1.2.1 Integrity

Integrity of performance refers to the degree to which required procedures and practices are implemented. It includes, among other things, the determination of whether

(1) the required inputs are present,

(2) established requirements are being carried out,

(3) contractual obligations are being met, and

(4) all systems elements are operational.

Assessing integrity requires attention not only to reported inadequacies but also to the possibility that routine reports incorrectly reflect the adequacy of program implementation.

3.1.2.2 Effectiveness

The effectiveness of performance refers to the degree to which the program objectives are being met. A direct determination of effectiveness would require information with respect to the presence of the desired outputs, which can be done only by direct measurement of the protection afforded against a defined threat. This after-the-fact measurement of effectiveness is generally difficult, and frequently effectiveness must be inferred from the combination of the expected system capability and the integrity of the implementation.

3.1.3 Assessment Activities

The measurement of the integrity and effectiveness of performance and giving the necessary feedback to other elements of the systems requires three basic types of activity: (1) collection and processing of information, (2) verification and validation of information, and (3) evaluation and review.

3.1.3.1 Collection and Processing of Information

The assessment system must provide for putting into place the sensing devices which provide data and other information from which to determine the integrity and effectiveness of the system and provide both assurance and feedback.

3.1.3.2 Verification or Validation of Information

The assessment system must provide for independent checks of the validity of reports and the direct verification of the capability of the system through exercises to test physical protection or independent verification of material inventories and accounting or other procedures.

3.1.3.3 Evaluation and Review

The assessment system must provide for evaluating the information and data collected to determine (1) the degree of assurance provided and (2) any necessary corrective actions or changes in requirements.

Important secondary aspects of this data evaluation and review are (1) the need to monitor the value of the assessment procedures themselves and (2) the need to utilize observed performance wherever possible to identify potential areas for methods development.

3.2 ASSURANCE

Several levels of assurance with respect to the performance of a safeguards and security program have been identified. They are closely related to the activities and outputs discussed in the previous section and summarized in Figure 2.

ACTIVITY	OUTPUT
ROUTINE REPORTING FIELD OFFICE, CONTRACTOR	FEEDBACK ON UNDERSTANDING OF REQUIREMENTS, BUDGETING NEEDS, AND TECHNICAL PROBLEMS
VERIFICATION SURVEYS, INSPECTIONS, RECORD AUDITS, INVENTORY AND FLOW VALIDATION	DETERMINATION OF ADEQUACY OR DEFICIENCIES IN PERFORMANCE OR IDENTIFICATION OF AREAS OF NONCOMPLIANCE
EVALUATE SYSTEM DESIGN SYSTEMS ANALYSIS, SIMULATIONS, RELIABILITY ANALYSIS, INSTRUMENT CHECKS	FEEDBACK ON DESIGN DEFICIENCIES AND RESEARCH AND DEVELOPMENT NEEDS
EVALUATE SYSTEM PERFORMANCE QUANTITATIVE MEASUREMENT OR JUDGMENT BASED ON AGREED INPUTS AND INTEGRITY OF IMPLEMENTATION	SUMMARY STATEMENT OF DEGREE OF ASSURANCE WITH RESPECT TO DEFINED THREAT

FIGURE 2. Assessment Activities and Outputs

3.2.1 Level I Assurance - System Capability

This level of assurance describes the degree to which the safeguards measures required and in place have the inherent capability to provide with high confidence that the nuclear material and facilities are adequately safeguarded against the defined threat. It is based on both the established effectiveness of individual safeguards measures and the absence of known deficiencies in meeting system requirements.

3.2.2 Level II Assurance - Integrity of Performance

This level of assurance describes the degree to which the inherent capability of the system is actually used at a satisfactory level of performance. It is based on continuous monitoring of individual safeguards mechanisms and practices and periodic checks that protective devices and measurement procedures are operable and in control. Together with assurance of system capability, assurance of integrity of performance implies effectiveness of performance based on the presumed effectiveness of the systems design.(1)

3.2.3 Level III - Independent Assurance

This assurance at any level of programmatic responsibility for safeguards describes the necessity to establish or verify independently the credibility of evidence and reports from lower levels concerning the effectiveness and

(1) The distinction between these complementary sources of assurance is reflected in the statement on Page 19 of the PAD (7/23/76) to the effect that the assessment program (1) "inspects and evaluates safeguards planning and performance" and also (2) "determines if existing requirements and directives are adequate and cost effective in specific facilities or transportation environments under current threat conditions."

integrity of safeguards and security performance. Both systems capability and integrity of performance must be independently verified. Some treatments of independent assurance have distinguished between measures designed to detect inadequate or incorrect reporting to conceal inadequate capability or incomplete performance; and measures designed to discover deliberate illicit acts. Both measures must be considered by those responsible for the implementation of the safeguards and security system.

3.3 FEEDBACK

Maintaining assurance of systems effectiveness requires continuous feedback of information on the adequacy of performance and the need for corrective action. Three types of feedback are of interest to the assessment program.

3.3.1 Process Monitoring and Production Control

The first and most direct feedback is administrative feedback based on established procedures. Specifications and standards of performance are established in advance, and actual program activities are contrasted to these standards. It involves only lower levels of the organizational or control hierarchy. The primary cognitive requirements are technical capability and understanding of procedures and policies.

3.3.2 Quality Control and Product Assurance

This type of feedback involves knowledge of the process and determining the extent and nature of the modifications required to produce a desired improvement in quality or to change the nature of the output produced. It usually involves middle management, subsystems knowledge, and deliberate two-way integration. It seeks changes within limitations of existing policy.

3.3.3 Policy Formulation and Policy Level Decisions

This level of feedback concerns the continuation of an activity or a change in requirement. It involves changes in, the creation of, or the elimination of structure, and requires total systems perspective.

With respect to the management and control of the assessment of safeguards implementation, these levels are roughly analogous to the role of the contractor, the field office and headquarters. The contractor is required to implement and adhere to safeguards and security related systems and practices stipulated by SS, Headquarters. The DOE field offices are required to monitor continuously and periodically survey and review contractor operations to identify and correct any deficiencies and to assure the effective implementation of and adherence to these systems and practices. Headquarters is responsible for the development and stipulation of requirements and the evaluation of the need for technical development and policy changes, as well as for the periodic assessment of field office performance (see Figure 1).

4.0 THE ASSESSMENT PROGRAM

4.1 PROGRAM SCOPE AND STRUCTURE

4.1.1 Management Structure

The basic three-tiered program management scheme of contractor, field offices, and headquarters division was noted in Chapter 2.0. The SS Assessments Branch is responsible for determining the adequacy of the implementation of the SS program by field offices, including independent assurance of contractor performance. It is concerned with the promulgation of new or modified requirements based on continuous assessment and feedback of evaluative information to SS design and development. It is responsible for international inspections required to determine the adequacy of physical security measures in other nations in accordance with stated export policies.

In addition to these responsibilities of the SS Assessments Branch, certain other headquarters and field office functions are necessary to the total assessment of safeguards and security program implementation. In particular, the Safeguards Analytical Laboratory, the Nuclear Materials Management and Safeguards System, and the Personnel Clearance Program all play an important part in the development and processing of information which provide both direct assurance of program effectiveness and evaluative feedback. The field offices have a substantial responsibility for independent verification and immediate feedback as well as the gathering, processing and transmission of information for review and evaluation. This guide deals with the assessment program in a generic sense. Specific SS management responsibilities are given in detail in program documents.

4.1.2 Program Structure

Certain characteristics of the safeguards and security program assist in establishing areas within which integrated assessment programs can be established.

4.1.2.1 Measures

The measures included in the safeguards and security program can be characterized by whether they serve the function of:

(1) Protection. The function of protection is to prevent or deter actions by a potential or actual adversary. Protective measures are directed toward people.

(2) Control. The function of control measures is to monitor, detect or respond to a change in the state of the target of the unauthorized act. They are directed toward the material, facilities, or information to be protected.

The division between control and protection is a basic one, and is based on the fact that the safeguards and security program is concerned with the misuse by people of materials, facilities, property, and information. Security and physical protection have traditionally been service functions while control, whether of property, materials, or money, has been a staff function. Neither is basically technical.

4.1.2.2 Targets

The safeguards and security program is concerned with the control and protection of (see Figure 3)

(1) Special Nuclear Material (SNM)

(2) Nuclear Facilities

(3) Classified Information

(4) Government Property.

4.1.2.3 Activity

The activities involved in the safeguards and security programs being assessed are

(1) Administrative

(2) Scientific and Technical

(3) Evaluative.

4.1.3 Assessment Scope

It is possible to look at entirely separate programs for the assessment of "administrative procedures for the protection of SNM" or "technical procedures for the control of property" and so on through all possible combinations of the eight categories with the three activities given above. However, we have already stipulated the desirability of integrated assessment of broadly comparable activity, and the above type of classification is probably more useful to insure completeness of our assessment program than as a meaningful division of activity.

4.1.3.1 Integrated Assessment Program Subdivisions

Several meaningful criteria for subdivisions of the assessment program are:

(1) Division based on the similarities among the technologies involved. Technical and scientific problems encountered in assessing reactor operation are likely to be quite different from those found at fabrication and at processing facilities.

(2) Division based on the similarity of the analytical and evaluative procedures used to measure performance. In particular, these are strongly dependent on the function (protection or control) being assessed.

(3) Division based on the type of information needed and the classes of information systems involved. Basic information sources are frequently widely separated in contractor organizations.

Subdivisions along these lines make it easier to form assessment teams with the correct technical and scientific abilities, easier to acquire and process information, and easier to evaluate and compare performance.

4.1.3.2 Subdivisions for Assessment

Division on these bases defines the following areas for integrated assessment:

(1) All physical and protection activities related to nuclear material, nuclear facilities, and classified information. These activities involve comparable technical procedures and mechanisms and similar measures of performance. (Subdivision I, Figure 3.)

(2) All material control activities, including immediate and deferred techniques for real-time control and surveillance, and mass balance accounting. These are distinguished from other control activities (e.g., document and information control) by their strong dependence on measurement techniques. (Subdivision II, Figure 3.)

(3) The protection of non-nuclear government property for which DOE is responsible. The character and level of both motivations and techniques are much different than for nuclear areas. (Subdivision IV, Figure 3.)

(4) As shown in Figure 3, the remaining two of the basic eight categories are control of nuclear facilities and control of classified information. (Subdivision III.) Because the first arose naturally as a part of the safety program (e.g., failsafe design of tanks) it is seldom recognized or treated as a part of the safeguards program. The second was traditionally a library function, but with recent emphasis on computerized information, new control problems have involved different and varied assignments of organizational or technical responsibility. It could be assessed independently or combined with the Control Activity as in Figure 3.

Note that the eighth category, control of government property, is not normally the responsibility of SS.

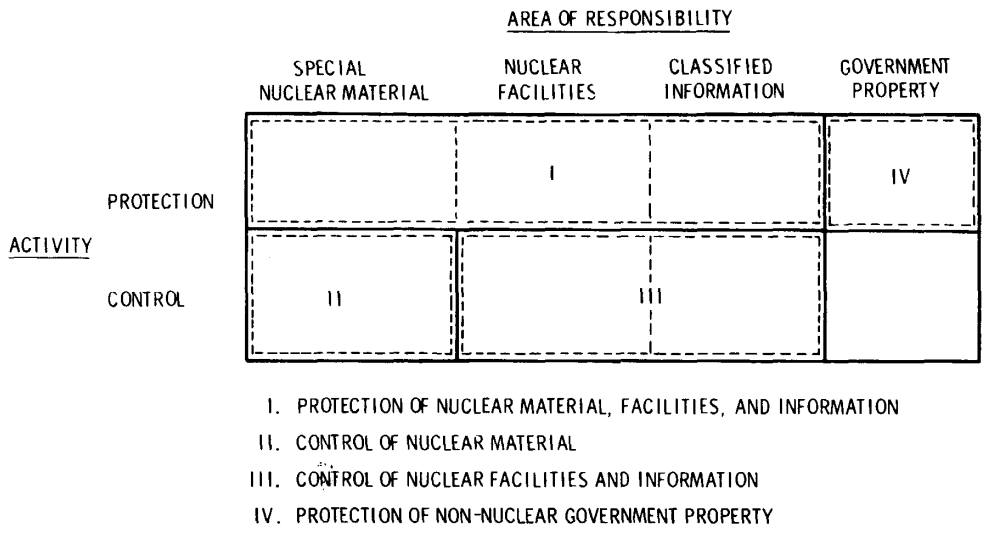

FIGURE 3. Subdivisions of Assessment Program

The first two sub-divisions replace the traditional split of safeguards into physical protection, material control and material accounting. The new division emphasizes the fact that material accounting is only one part of the larger problem of controlling material flows and inventories, just as a balance sheet is only one part of the accounting process. A graphic presentation of the total material control concept is shown in Figure 4.

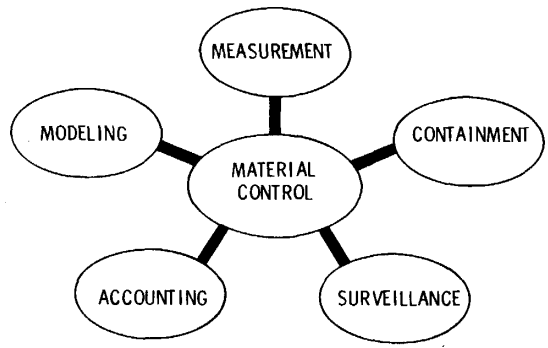

FIGURE 4. Material Control

4.2 ORGANIZATIONAL RESPONSIBILITIES

This section deals specifically with the responsibilities of contractors, field offices, and the headquarters division for assessment and related activities.

4.2.1 Contractor Responsibilities

The primary responsibility of the contractor is for the planning and implementation of safeguards and security systems which are responsive to DOE requirements. His plans for meeting and maintaining the required level of implementation are subject to field office approval. Through responses to directives and periodic reports, he keeps the field office informed of his progress on approved plans. The emphasis is on providing the capability to meet the objectives of the safeguards and security program.

Several areas of contractor responsibility are vital to the overall assessment program.

(1) He must maintain an adequate record system reflecting both the immediate status of the nuclear material, government facilities, and classified information in his custody and the source data from which this information is derived. Both domestically and internationally, an adequate record system has been demonstrated repeatedly to be essential for effective inspection, verification, and evaluation.

(2) There must be an effective program of quality assurance to assure that the performance capability of individual elements of the system is maintained. This includes at a minimum:

   (a) Methods for testing and maintaining the integrity and capability of protective devices such as barriers, alarms, monitors, and other security devices as well as testing and training to maintain the performance level of security personnel.

   (b) Control and maintenance programs with respect to the measurement capability of both instruments and analytical laboratories, with particular emphasis on the reliability of techniques for immediate material control based on seals, surveillance devices, and systems for real time recording of material status.

   (c) Records audits to insure that control procedures for determining both immediate status and overall accountability are adequate and effective.

(3) The contractor must be in a position to comply with reporting requirements at all levels. In particular, the system must provide exception reporting and immediate notification of unusual incidents or system problems, leading both to the rapid and immediate feedback necessary for maintenance of capability and to the first level of confidence in the way the system is functioning.

A primary requirement for effective contractor performance is that he understands the rules and requirements and his contractual obligations for recording, reporting, and internal control audit.

4.2.2 Field Office Responsibilities

The primary assessment function of the field office is to monitor contractor performance. While field office and contractor responsibilities for planning and implementing the safeguards and security program are interrelated, the assessment function of the contractor given in the previous section emphasize establishing and maintaining the capability to perform. In assessing performance the field office must be sure that program levels are adequate to meet all safeguards and security requirements and that established standards for actual performance are met.

This includes, as noted in the previous section,

(1) Making clear to the contractor what performance is required through local interpretation and adaptations (with Headquarters' concurrence) of requirements and approval (again with Headquarters' concurrence) of contractor designs and plans for implementation.

(2) Designing a program to (a) measure performance against the requirements, with particular reference to the integrity of contractor performance, and (b) transmit to headquarters on a continuing basis the information necessary to allow headquarters to fulfill their planning and analysis responsibilities with respect to research and development, budgetary planning (including recommendation to other program divisions) and overall assurance of safeguards effectiveness in relationship to the defined threat.

Two major aspects of the field office responsibility to measure performance are:

(1) The field office must continuously monitor the adequacy of contractor performance based on direct observation, and an agreed-upon scheme of contractor reporting. Legitimately recognized deficiencies or cases of noncompliance should be identified and recommendations for correction made and followed up. Deficiencies in performance should be largely resolved at the field office level, but deficiencies in capability involving need for systems design and development or budgetary attention with respect to either equipment or personnel should be continuously and routinely forwarded to SS and/or the appropriate Headquarters division. There is also a Headquarters requirement for information concerning the occurrence and resolution of performance deficiencies so that their responsibility for the monitoring of the overall level of safeguards assurance can be discharged.

(2) The field office must conduct periodic in-depth surveys to:

(a) Probe in depth into the adequacy of the demonstrated or reported performances, with particular reference to the longer range development of contractor capability, both organizational and operational.

(b) Audit performance and verify records and inventories to determine that records and reports correctly and fairly reflect the status of the safeguards and security program.

Verification and audit imply the possibility that the records and reports are incorrect. There are two ways in which this can happen: (1) the integrity of system performance has been misrepresented by a contractor, perhaps inadvertently through a lack of knowledge of the malfunction or inadequacy of some system element, or possibly deliberately to cover up inadequate performance; or (2) the system is performing adequately, but is being deliberately misused or bypassed because of the desire of the contractor or responsible individuals to perform one of the acts the system is designed to prevent. Independent assurance against both possibilities must be provided. In addition the entire program must concern itself with identifying necessary changes in requirements, as opposed to complying with current requirements.

4.2.3 Headquarters' Responsibilities

The headquarters' assessment role emphasizes evaluation and independent assurance. Two key areas of activity can be identified:

(1) Providing independent assurance that the field offices have met their responsibility for monitoring and verifying the integrity of contractor performance and for determining and reporting technical and administrative requirements for maintaining capability at adequate levels. This must of necessity involve some independent assessment of contractor performance.

(2) Assessing and evaluating the collective performance of the safeguard and security system across the entire spectrum of contractor-field office interaction. This implies the need for

(a) A system for the accumulation and processing of data from routine and nonroutine reports, contractor inventories and audits, field office surveys, and headquarters evaluations.

(b) Data from analytical or other procedures for determining the level of assurance provided by the data and systematically identifying weak points in the system requiring corrective action.

While none of the following is defined as part of the assessment program, they are all essential to carrying out both independent assessments and the evaluation of collective performance:

(1) Precise and preferably quantitative, definitions of:

(a) The threat against which the system is to be effective

(b) The acts or actions which the system is designed to prevent, including a determination of the relative importance of facilities and materials.

(2) System or processes for stipulating and collecting pertinent safeguards information such as Diversion Path Analysis (DPA) or its derivative, Initial Diversion Vulnerability Assessment (IDVA).

(3) Models and methods for computing and characterizing systems effectiveness based on observed inputs, such as EASI.[2]

(4) Determination of the expected effectiveness of safeguards mechanisms, so that the needed corrective actions and the requirements for upgrading existing systems can be established.

5.0 METHODOLOGY

The methodology of assessment is concerned with (1) acquiring information about safeguards and security and (2) evaluating it. Validation of the information received is considered to be an initial part of the evaluation function. All of the many assessment activities involve these two functions, namely obtaining relevant information in sufficient detail and, from the information base, developing meaningful evaluations of capability, performance, and as an assessment product, assurance of the adequacy of safeguards and security. Actual assurance results from evaluating performance and capability against the specified threat. Guidance on the current threat against which protection is designed to be effective is contained in safeguards and security memorandum (H. Lyon to field office managers) of November 11, 1976.

5.1 INFORMATION REQUIREMENTS FOR ASSESSMENT

5.1.1 Background Information

Proper assessment of safeguards and security capability and performance requires complete information on the processes and facilities being protected. Normally, the data are available on a periodic basis in field office records. Design information on processes is essential to an understanding of material control. In addition, both design and construction aspects of reactors and other processing facilities are necessary to a review and evaluation of information concerning the functioning and effectiveness of physical protection systems. A related element is the need for information on the location and capacity of storage facilities for nuclear materials.

The second broad class of background information required for assessment is management information, particularly the organizational responsibilities and operating practices at the facility or operation being assessed. This is necessary to an understanding of the manner in which the safeguards and security program is organized and implemented. Further the nature and effectiveness of

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(2) H. A. Bennet, "The EASI Approach to Physical Security Evaluation." SAND76-0500, NUREG 760145, NRC-13, January 1977.

the organization and the approach taken to the definition and promulgation of operating practices may in themselves be indicative of both the attitude and the capability and performance of the contractor.

A third class of background information necessary to assessment is the applicable provisions of management directives and performance requirements. This information is required to determine compliance with requirements. It is also an important element in the evaluation of effectiveness, since a realization of the necessity for changes in requirements may result during such evaluations.

5.1.2 Evaluative Information

Perhaps the single most important question is what type of information should be obtained on which to base an assessment. This brief summary will be structured about the assurance levels introduced in Section 3.2.

The most available assessment information is that concerned with capability. Field office and Headquarters' approval of contractor plans for implementation and the procedural reviews associated with inspection are ways of periodically determining whether the system is capable of providing adequate performance. Assessment procedures must evaluate the adequacy of detection and protection systems, of surveillance systems, of measurement systems, of record systems, of information systems, of training programs, of vaults and safes, of calibration programs, of response capabilities, and all the other contributing elements of the total safeguards system. Management practices and reporting systems must be checked. Accounting practices associated with material, property, and classified information must be audited. The adequacy of some of these systems can be checked directly. Other parts are highly dependent on the monitoring of contractor programs for information processing and quality assurance. Obtaining the necessary information requires a judicious blending of continuous field office monitoring and in-depth surveys.

Performance information is not so easy to obtain or interpret. Cumulative reports of unusual incidents such as misplaced material, missing property or documents, open files, inoperative monitors or barriers, and other indications of system malfunctioning give some indication of performance, but care must be taken in interpreting them, since they may depend almost as much on the adequacy of the reporting as the adequacy of the performance. Control charts or other techniques to measure change in performance level are very important, since inconsistent performance is frequently an indication of inadequate performance independent of any absolute level.

Independent assurance of capability can be obtained by the assessment team through independent tests of instrument performance, duplicate material tests performed by the Safeguards Analytical Laboratory, independent calibrations of equipment such as scales, and other procedures designed to verify directly the functioning of the system elements. Independent assurance of

performance is again more difficult. Independent verification of inventories and flows, physical probes or tests of the effectiveness of physical protection, and other similar techniques can provide some additional assurance. Much of the independent assessment of effectiveness of performance, however, is still based on the judgment of those personnel who closely monitor the operation.

Field office performance is reflected mostly in the capability and performance of the contractor systems, the primary exceptions being the effectiveness with which requirements are promulgated and pertinent information collected and transmitted to Headquarters.

5.2 INFORMATION SOURCES FOR ASSESSMENT

Sources of information for assessment are primarily routine and nonroutine reports, and inspections. Monitoring is a component of inspection.

5.2.1 Routine and Nonroutine Reports

Various manual chapters and performance requirements contain many specific requirements for reporting designs and implementation plans, actions on identified deficiencies, unusual incidents, and investigations under the safeguards and security program. The concern here and in subsequent parts of this guide is with the role and use of reports in the assessment program, rather than with administrative procedures and other contractual requirements, however necessary to program implementation.

Nonroutine reports by their very nature are based on the need for immediate knowledge on the part of responsible management. This presumably but not always results from the need for immediate corrective action, and usually directly involves inadequate or undesirable performance. Assurance is not the question. The important assessment activity is the cumulative evaluation of the past conditions surrounding each reported incident or exception to determine the causes and, if possible, to eliminate the source of the difficulty. Routine reports serve much the same function except that the condition reported may not be so directly associated with systems inadequacies, possibly not related at all.

Information in both nonroutine and routine reports provides the only basis for continuous assessment. The only advantage over inspection is the rapidity of the feedback. An essential element is provision for the rapid transmission, cumulation of important history, analysis, and evaluation of the information reported. A routine reporting system without this property is self-defeating, since it is automatically incapable of providing the rapid feedback intended.

5.2.2 Surveys and Inspections

The backbone of the present assessment program consists of the one-over-one periodic inspections carried out by the field office and headquarters personnel. Although Headquarters' inspections may not normally involve direct

checks of material or contractor practices at the level of detail accomplished in field office surveys, both inspections involve similar and mutually supporting activities.

Inspection is the first integral part of the assessment program. It must be based on careful and in-depth investigations and review. When coupled with evaluation, it usually provides assurance concerning the status of material or a facility, or the proper functioning of the system designed to protect it. The objective of inspection is to provide an information base for evaluating the past, present, and future effectiveness of safeguards and security systems. Safeguards and security inspections are similar to traditional audits in that they examine evidence, review procedures, audit books, make measurements, observe practices, evaluate results of the inspection and, finally, provide assurance regarding effectiveness of the overall system. However, the nature of inspection has varied because of assumptions regarding the threat levels, the degree of assurance required or the rights and capabilities of the inspectors. The inspection strategies vary somewhat according to the varying nature and value of individual DOE facilities.

5.3 EVALUATION

Evaluation is the second integral part of assessment. Effective use of the information requires both adequate data processing capability and models and procedures for interpreting the data. While the associated methodology is not always unique to safeguards assessment, its availability and appropriate utilization is a necessary part of the total assessment process. Implementing effective evaluation practices to achieve assurance and feedback must involve effective collection, collation, processing, analysis, and retrieval of background and evaluative information. While this guide cannot deal with the data processing methods required, it does consider the specification of information system needs for effective evaluation.

A closely allied treatment deals with the availability of models for analyzing and evaluating effectiveness. These range from appropriate assurance statements and indices of performance to relatively elaborate models for estimating the probability of a successful attack or computing the limits of error for a material estimate. While such quantification may be difficult at the higher functional levels of safeguards objectives, it does foster a consistent and logical treatment of evaluative data even where informed judgment must be used to place a value on individual elements of the total assessment.

5.4 DESCRIPTION OF ASSESSMENT ACTIVITIES

5.4.1 Physical Protection of Nuclear Facilities, Nuclear Materials and Classified Information

In the planning for assessment activities, both those facilities containing nuclear material and those with classified information are identified, as an initial step. The inspections are directed to all such facilities and include:

(1) A review of background information, including reports of previous inspections.

(2) The preparation of guides and data sheets designed to insure depth and completeness of coverage. Both background documentation and data collection may be requested and distributed prior to inspection.

(3) A review of procedures, records, reports, and other appropriate data and information to verify that the system being assessed has been established in accordance with applicable requirements (capability). As examples, the reviews would cover, in part, descriptions of vital equipment (design, construction and use), protected material access areas, barriers, fencing and the security guard force.

(4) The investigation of selected elements of the system to the depth necessary to determine whether or not such elements are being implemented in conformance with applicable requirements (performance).

(5) Detection and effective responses to breaches in the containment of SNM on time schedules appropriate for each facility.

(6) The utilization of personnel with proper clearances.

(7) The investigation of identified unusual incidents to the depth necessary to determine their cause so as to be able to establish the proper nature and extent of recommended action.

(8) The documentation of each unusual incident to record concurrence of the contractor with the accuracy of the statement of the finding and any agreed-upon corrective actions, and provisions for follow-up.

(9) The reporting and analysis of the inspection results so as to identify necessary Headquarters' actions with respect to needed research, design, allocation of resources, and development or recommended corrective action to alleviate weaknesses identified.

With the concurrence of the contractor the field office may hire consultants to pulse the physical protection system by way of providing false personnel identifications, surreptitous (but nonviolent) penetrations, and overloads of physical protection procedures and capabilities. The contractor's protection system and facilities may also be submitted to modeling and scenario evaluation.

5.4.2 Control of Nuclear Material

Background and operating information comes from the contractors' bimonthly inventories, giving information about his auditing and material control practices and their compliance with requirements specified in IMD 6104. Information is required about shipper/receiver agreement, the process flow, including the amounts and locations of material held in the various inventories and in

waste. Use is made of the bounds for material balance areas, independent locations, inventory strata, and substantiation goal quantities (Annex A).

Evaluative information is required to assess capability, performance, and to obtain independent assurance.

Capability information is required in mass balance accounting, item or symbol accounting, measuring, statistical procedures for estimating random and systematic errors in interpreting accounting results and procedures for calibrating feed and discard tanks.

Performance information is required for the procedures used to derive identification, the records system, quality assurance and control, the results from the Measurement Control Program and sample exchanges, the procedures for assuring that discards are made, the item accountability practices, the response to material discrepancies, tag accountability, the use of tamper-indicating seals and the physical inventory procedures used to compensate for the material held up on process equipment.

Independent assessment relies upon the results of measurement control program tests of samples submitted by the field office and shipper-receiver results.

Field office activities are characterized by their performance in non-destructive analyses (NDA) and chemical tests, their treatment of statistical data, and timeliness of reports of surveys.

Information sources consist of reports, discussed in Section 5.2.1, and inspection, including monitoring and surveillance.

Inspection is necessary for acquiring information about the contractor's use of the response plan and actual response to unusual discrepancies, the contractor's concurrence in plans for necessary upgrading, and testing inventories according to sampling plans that consider threat levels and potential adversary strategies. Available tests are item counting and identification, checking item correspondence with the contractor's inventory, weighing, other NDA, chemical tests, and independent reference tests. The frequency of inspection is determined, in part, by the amounts of SNM held.

Evaluation addresses the contractor's material transfer and central records system, judging whether reported discards are reasonable, and the effectiveness of material control practices by contractors and field office.

5.4.3 Control of Nuclear Facilities and of Classified Information

The assessment reviews the capability existing for monitoring off-normal development in nuclear facilities and evaluating the control of classified information; i.e., what designs, facilities and procedures exist to assure that willful actions to reduce or eliminate the effectiveness of safeguards

within facilities have not occurred, or that the control over classified information has not been compromised.

The safeguards and security inspections here are focused on control of facilities and procedures to accomplish the mission. For example, the following are inspected:

(1) Vaults and other enclosures and their locking mechanisms

(2) Existence of fail-safe and tamper-proof or -indicating features of alarms, detectors, seals, and locks, pressure-sensitive alarms, source containment detectors, and pressure surveillance devices

(3) Procedures that properly identify the adequacy of the repository to which SNM or classified information is being transferred

(4) Features in place to harden on-line data processing and control computers

(5) Procedures, equipment and techniques in place to provide transmission security, crypto-security and emission security of classified information.

5.4.4 Physical Protection of Non-nuclear Government Property

Assessment activities shall gather sufficient information about the physical protection and control measures of non-nuclear DOE property to evaluate properly their adequacy commensurate with the level of importance or cost of the facility.

The design of the protective elements at a DOE facility shall be inspected including physical barriers, guards, watchmen, burgler alarm systems, locks and keys, designation of protected areas, and routine and emergency procedures. Inspections shall provide information to evaluate any of the specific protective elements noted above and others, as procedures for controlling access, identifying and denying entrance for prohibited articles, and the operation of devices and equipment installed to detect and warn of unauthorized entry and willful misuse or destruction of DOE property.

6.0 HEADQUARTERS' SAFEGUARDS AND SECURITY ASSESSMENT AND REVIEW PROGRAM

The Assessments Branch, Safeguards and Security, Headquarters, conducts a program of assessments and reviews. The scope of the program includes the subdivisions of assessment activity given in paragraph 4.1.3.2.

6.1 CATEGORIES OF ASSESSMENT/REVIEW ACTIVITIES

The Assessments Branch conducts Assessments and reviews in seven categories. Four of these categories are domestic tasks and three involve foreign tasks. These categories and the activities involved are:

6.1.1 Comprehensive Assessments

The comprehensive Assessment is the basic responsibility of the branch during which comprehensive reviews are conducted of the multi-discipline programs of DOE Safeguards and Security. Assessments are performed to evaluate the effectiveness of safeguards and security programs administered by DOE operations offices and implemented by DOE contractors. An assessment is a critical review of the full spectrum of safeguards and security activities at one operations office and selected contractor operations administered by that office. The safeguards and security interests covered in an assessment include all the assessment activities of paragraph 4.1.3.2.

Assessments typically are performed by a team of three to four Headquarters, Safeguards and Security staff (representing each assessed discipline). The team may be supported by consultants who bolster the team's expertise in specific areas. The team typically spends 2 to 3 weeks at an operations office and its associated contractor facilities. There are 10 operations offices in the DOE program at which comprehensive assessments are performed annually.

6.1.2 Area Office Reviews

An area office is an administrative unit subsidiary to a field operations office. An area office typically is concerned with a single, though major, contractor-operated facility. The field operations office may delegate administration of one or more safeguards and security disciplines to an area office. The Headquarters, Assessments Branch, review of an area office is a critical evaluation of the safeguards and security activities administered by the area office and implemented by the contractor-operated facility.

An area office review is typically conducted by a two-person team representing expertise in the disciplines delegated to the office. The review typically requires 1 week at the area office. There are seven area offices in the DOE program. These offices are reviewed biennially.

6.1.3 Field Office Survey Participation

Field offices routinely conduct in-depth surveys of contractor-operated facilities under their administration to determine compliance of the safeguards and security program with DOE Interim Management Directive requirements. The results of these surveys are reported to Headquarters and are used as background for comprehensive assessments.

Field office surveys are typically conducted by multi-person teams from field office safeguards and security divisions who spend from 1 day to many weeks at a facility.

To evaluate the field office survey program and to verify the accuracy of survey reports, the Headquarters' Assessments Branch participates with field office survey teams. The Assessments Branch typically will review a single discipline and therefore a single person will participate. The survey participation period will vary with the complexity of the surveyed facility program. It is estimated that the average will be 2 weeks. Approximately 200 surveys are conducted annually with the Assessments Branch participation scheduled for 10 per year -- one for each field operations office.

6.1.4 Security Reviews of Energy Research Centers and Other DOE Facilities

The DOE incorporated Energy Research Centers and other energy facilities have been included in the responsibilities of the Assessments Branch. These facilities are administratively autonomous and include security interests which involve physical protection and some security controls. Reviews of these facilities evaluate the existing physical protection and security controls and recommend needed modifications.

These reviews typically are conducted by two-person teams during a period of 1 week at the facility to provide for familiarization as well as evaluation. Subsequent reviews will likely require less time. Each of these facilities will be scheduled for annual reviews.

6.1.5 Bilateral Safeguards Inspections

The U.S. has one agreement for cooperation which requires that bilateral safeguards inspections be conducted. This agreement with France requires one inspection annually.

A safeguards inspection is a material control, material accountability activity. Reports which are received are reviewed and verified onsite. The program for the use of these materials is also reviewed.

The safeguards inspection is typically conducted by a single person from the Assessments Branch and requires 1 week of field effort annually.

6.1.6 International Physical Security Reviews

The Assessments Branch provides technical support for international physical security reviews. These reviews are required to determine the adequacy of physical protection accorded to nuclear materials in countries to which U.S. nuclear materials are to be supplied. These reviews are typically conducted by a three-person team with one each from Safeguards and Security, Division of International Security Affairs, and the Nuclear Regulatory Commission. They are normally scheduled to cover several countries on a single trip. Approximately four reviews are conducted each year and involve one Assessments Branch staff member in the field for 2 weeks per review.

6.2 GENERAL PLANNING AND SCHEDULING

6.2.1 Planning

Assessments Branch activities are planned to meet annual requirements for Assessments and reviews. Priorities and interdependence of activities guide the planning to seek maximum effectiveness in the use of available staff and travel funds.

6.2.2 Scheduling

A schedule of assessment and review activities is prepared annually and is based partially on information provided by the field offices regarding their own survey schedules. The proposed schedule is circulated in advance to all organizations involved to permit matching of schedules and permit modifications to accommodate specific circumstances where necessary.

6.3 HEADQUARTERS COMPREHENSIVE ASSESSMENT PROCEDURES

Section 6.1.1 gives a brief general description of the procedures followed.

6.3.1 Preliminary Information Review

In preparation for an Assessment, the following sources of information will be reviewed to ensure that unresolved questions are pursued during the assessment:

(1) The Assessments Information System, Safeguards and Security, Headquarters.

(2) Previous Headquarters' Assessment reports.

(3) Field office survey reports.

(4) The Headquarters, Safeguards and Security exception file.

(5) All central outgoing correspondence files on the appropriate field office and associated facilities.

(6) Nuclear Materials Management Safeguards System (NMMSS).

(7) The Safeguards and Security Plan for each facility associated with the Assessment.

6.3.1.1 Internal Safeguards and Security Coordination

Concurrently with this review, a memorandum from the Chief, Assessments Branch, or the Chief Inspector, will be sent to all Assistant Directors notifying them of the Assessment dates and requesting them to notify the Assessments Branch on specific subjects or areas on which Assessment Team action is desired.

6.3.1.2 Checklist Preparation

Following this review and coordination, a checklist shall be prepared for Team use. The checklist shall include (but not be limited to):

(1) Previously identified deficiencies/recommendations that have not yet been resolved, the date reported, the source (Headquarters of field office) and the desired resolution date (if available).

(2) Specific items requested by Headquarters, Safeguards and Security, Assistant Directors, for team action.

(3) Correspondence awaiting action or in the Safeguards and Security, Headquarters concurrence chain, the subject of the correspondence, the proposed action (or answer) and the action officer assigned.

6.3.2 Interaction with the Operations Office

Initial contact with some field offices is begun at the time the annual schedule is developed. At least 45 days prior to the scheduled date for the assessment to begin, the assessment team leader will send to the field office Director, Safeguards and Security Division, a proposed detailed schedule for the assessment including the contractor facilities selected for review. A briefing package should be requested in return from the field office to include at least the following information:

(1) Appropriate organization charts for the operations office and its associated major contractors.

(2) Information on safeguards concerns at major contractor facilities including material types, quantities, forms, locations, and material control and accountability procedures and personnel.

(3) Information on physical protection provisions at the contractor facilities selected for review including the alarm or detection systems in use and where installed; types of such systems (e.g.,

microwave or ultrasonic), display locations for detection system information; details on storage vaults or vault-type rooms; guard force deployment during operating hours, off-hours, weekends; alarm and detection system test procedures used by guard force or other personnel; special area designations -- e.g., protected area, limited area, security area, exclusion area, material access area, access control provisions, special badging practices and procedures and where these are applied.

(4) Statistics for security controls, e.g., number of clearances processes in the current year, number of interviews, infractions, unaccounted for documents, and other pertinent information.

(5) Status of upgrading actions and plans for safeguards and security upgrading.

(6) Status of previous recommendations made in Headquarters reports or field office survey reports.

(7) Specific information for each area containing safeguards and security interests on where, in the opinion of the operations office, safeguards and security provisions in force are, or are not, in compliance with appropriate DOE directives and requirements.

(8) Any proposed changes to safeguards and security plans for facilities associated with the Assessment and the rationale for such proposed changes.

The operations office's safeguards and security staff will brief the Assessment Team on staff operations and procedures followed by the contractor who will brief the Team on operating facilities with safeguards and security significance.

6.3.2.1 Contractor and Facility Review

The team reviews and examines safeguards and security provisions in force at the selected contractor facilities to evaluate the adequacy of the administration of the operations office's safeguards and security program.

6.3.3. Review and Evaluation Scope

The review may include, but need not be limited to, interviews of contractor and operations office personnel in all the disciplines covered in sections 6.3.3.1 through 6.3.3.4; walking tours through facilities in which operation of safeguards and security significance occur; tests of installed alarm and detection systems; patrol and guard force response tests; review of SNM record logs, and transfer documentation wherever applicable; review of training records; and examination of such other aspects of the safeguards and security program as the team may deem necessary.

6.3.3.1 Physical Protection

In reviewing physical protection provisions at contractor facilities, the team will be guided by the requirements of DOE Interim Management Directives

6102, 6103, and 6105. Guidance on the current threat against which protection is designed to be effective is contained in safeguards and security memorandum (H. Lyon to field office managers) of November 11, 1976.

Details of construction of storage facilities, intrusion detection system provisions, patrol force area deployment and assignment, communications system, access controls, and facility location with respect to outer boundaries will be noted for use with the Estimate of Adversary Sequence Interruption (EASI) program if required. If operations office or contractor personnel have analyzed physical protection provisions with EASI, the team will conduct confirmatory runs on selected locations. Otherwise, the team will analyze selected locations with EASI and conduct a seminar for operations offices and contractor personnel on the use of the EASI method (see paragraph 4.2.3).

6.3.3.2 Material Control

In reviewing material control provisions at contractor facilities, the team will be guided by the requirements of DOE Interim Management Directives 6103 and 6104 and their appendices.

During this review, the team will familiarize themselves with details of material flow through nuclear process lines and take particular note of:

(1) Personnel access to materials
(2) Measurement points
(3) Measurement systems in use
(4) Material handling procedures
(5) Material storage and containerization procedures
(6) Material forms
(7) Material radiation hazards
(8) Inventory and inventory verification activities
(9) Measurement quality assurance programs
(10) Material losses and loss mechanisms.

Material control activities may utilize support from the New Brunswick Laboratory (NBL) or the National Bureau of Standards (NBS) or other organizations from time to time. Consultants from NBL have assisted teams in reviewing measurement systems and measurement control techniques. NBS consultants have applied Initial Diversion Vulnerability Analysis (IDVA) techniques (as described in NBS Draft Document SIRM-86).

6.3.3.3 Security Controls

Security Controls consist of Personnel Clearance (PC), Visitor Control (VC), Document Control (DC), and Security Education (SE).

6.3.3.3.1 Personnel Clearance. Review of the PC function should ensure that three essential aspects of the PC program are reviewed: that clearances processed are legitimate and fully justified, that such clearances are properly processed within a reasonable time frame, and that the rights and privacy of the applicant are never unduly infringed upon or violated.

To accomplish such review, attention must be paid to the guidelines utilized by the contractor or DOE office to determine the basis for requesting clearance or access authorization. This basis must conform with the provisions set forth in 10CFR Part 710.1. The use of escorts or physical barriers, if feasible, to reduce the required number of clearances should be noted.

The screening and analysis function, and whether there is reasonable conformance to the provisions of the criteria (contained in 10CFR, Part 710) and Headquarters guidance should be assessed. Interview summaries and transcripts should be reviewed to determine the propriety of interviews. In this regard, such aspects as deviation from the legitimate areas of security concern, failure to cover necessary items or to properly pursue areas of security concern disclosed by the applicant, and whether the applicant is treated properly should be explored.

The time to process clearances should be noted. All phases of the clearance process should be considered from initial pre-screening to the notification of the requestor.

Of utmost importance is to determine whether the applicant's rights and privacy are being unduly violated during any phase of the clearance processing, e.g., handling of Part II of the Personnel Security Qualification (PSQ), handling of PC information by contractor and DOE, unnecessary interviews, lack of compliance with provisions of the Privacy Act.

Finally, determination should be made regarding the procedures followed when clearances are terminated, and, in particular, in cases involving termination for serious cause. The destruction of Personnel Security Files (PSF) should be reviewed to determine if this function is being accomplished within the prescribed time frame.

6.3.3.3.2 Visitor Control. Review of the VC function should cover the procedures utilized for all incoming and outgoing classified visits. Attention should be paid as to whether procedures for clearance verification and determination of "need-to-know" are proper.

Visitor and employee identification (badges) should be reviewed to determine the effectiveness of this part of the access control system.

6.3.3.3.3 Document Control. This review should assure that the system being utilized is effective in accounting for classified material and limiting access to such material to properly cleared individuals who have the prescribed "need-to-know." Documents should be spot checked to verify accountability and

document procedures. In addition, special attention should be paid to procedures used to control Top Secret, Weapons Data, Research and Development Reports, and other special categories of classified information.

Procedures for handling unaccounted-for documents should be examined and pertinent aspects of the infraction program should be reviewed.

6.3.3.3.4 Security Education. A review of the SE program should be made to ensure that all individuals have access to classified information or special nuclear materials receive, as a minimum:

(1) An effective initial indoctrination prior to having access

(2) An effective refresher lecture within a 3-year period

(3) A suitable lecture upon termination.

A determination should be made as to whether the SE program is properly geared to the sensitivity of what must be protected and to the type of individuals exposed to the SE program, e.g., custodian or physicist.

Any supplements utilized in the required indoctrinations, e.g., posters, films, viewgraphs, should be noted.

6.3.3.4 Materials Accounting

Materials accounting review at the DOE Headquarters level consists of audits of the field offices' nuclear material accounting records. Prior to the conduct of an assessment, the auditor must examine and list all of the appropriate contractors' Material Status Reports (MSRs). This effects an independent consolidation of material status information and produces a trial balance for each material type which is then cross-checked with the Transfer Journal Summaries (TJ-19s and TJ-14As) from the Nuclear Materials Management Safeguards System (NMMSS). Other audit packages (e.g., TJ-7, TJ-8A, TJ-23, and TJ-26) are requested from the Computer Sciences Division at Oak Ridge, as required. Workpapers are prepared for use in the field. During the accomplishment of these tasks, discrepancies and other questions which arise are coordinated with the Assistant Director for Information Support and resolved to the degree possible. In the field, the auditor, utilizing the workpapers prepared in Headquarters, proceeds to:

(1) Verify and resolve discrepancies or questions identified earlier during the review process.

(2) Determine whether procedures used in accounting for nuclear material use are consistent with DOE IMD 6104 (Immediate Action Managers Directive).

(3) Determine that all necessary documentation has been prepared and is available.

(4) Determine that all document action is valid by performing a signature check to determine if MSRs have been signed by the Plant Manager.

(5) Determine, where appropriate, if distribution of documentation is timely and in accordance with DOE directives; e.g., proper TI codes, composition codes, dates material shipped versus dates documentation dispatched.

(6) Determine if reporting categories [Normal Operating Losses (NOL), Inventory Differences (ID), Write-Offs (WO), Decay] are consistently observed (proper categorization, documentation, authorization, and explanation).

(7) Determine whether material that has been sent for burial has been properly excised from the records.

(8) Verify and emphasize the importance of timeliness of provision of data inputs to NMMSS* and reduction of error rates in those data.

(9) Review field office nuclear material survey workpapers for scope and depth of coverage and adequacy of verification and reconciliation of the inventory to the records.

6.3.4 Assessment Conclusions

As the Assessment progresses, individual team members will review portions of the safeguards and security programs corresponding to their expertise. Categorization of their conclusions on the safeguards and security program are to be made as follows:

(1) Finding (F) - Factual statement describing weakness or area requiring correction or improvement.

(2) Recommendation (R) - A statement of actions needed to correct or improve an item noted as a finding. Each finding must be followed by a recommendation.

(3) Comment (C) - Mitigating information concerning a finding. The information may increase or decrease the severity of a finding. A comment is not necessary for each finding.

(4) Observation (O) - A statement or recognition of an area of strength or commendable action or a statement regarding a previous finding or deficiency.

6.3.4.1 Preliminary Documentation

On conclusion of each team member's review activities, a preliminary, handwritten list will be prepared and categorized as above.

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* Nuclear Materials Management Safeguards System.

6.3.4.2 Team Validation

Each team member will, at a full-team meeting to be scheduled by the team leader, present his proposed findings, recommendations, observations, and comments to the team for validation as team items. Each member should be prepared to defend each item on his list.

6.3.4.3 Validation with Field Office Staff

On conclusion of team review activities and the team validation of 6.3.4.2, a validation conference will be scheduled with the field office Safeguards and Security staff. The time required for this conference will depend on the team's conclusions, but normally, at least 1/2 to 3/4 work day should be allowed. The purpose of the validation conference is to ensure that situations or provisions observed by the team have not been misinterpreted. Where such is thought to be the case, additional data may be necessary for clarification. All team members should be prepared to defend items in detail.

6.3.4.4 Final Documentation (Field Report)

The team will prepare a field report which presents the observations, findings, recommendations, comments, and conclusions for the programs assessed. Conclusions are applicable only to the field office program administration. A cover page is prepared for the signatures of the team leader and field Safeguards and Security Director validating the accuracy of the report. Clerical assistance in preparing the report is required from the field office. A copy of this report is left with the field office.

6.3.5 Assessment Closeout with Field Office Management

The team, usually with the team leader as spokesman, briefs the field office manager and other staff on the more significant findings or problem areas. This briefing generally requires 1 hour.

6.3.5.1 Closeout with Contractor Management

The team, with the approval of the field office, briefs the contractor(s) on only that portion of the report which is applicable to the particular contractor.

6.3.6 Assessment Briefing to Headquarters, Safeguards and Security

Immediately upon return to Headquarters, the team leader will brief the Director, Safeguards and Security, on the significant findings and problem areas.

6.3.6.1 Categorization of Results

The assessment team will categorize deficiencies as: Category I -- those requiring immediate or emergency action and the taking of immediate interim

measures; Category II -- those requiring prompt action and interim measures; and Category III -- those where corrective action can be deferred pending study or additional consideration."

The assessment team will, at the time of the closeout, advise the field office manager of those deficiencies it regards as Category I.

6.3.6.2 Information Memorandum to the Assistant Secretary for Defense Programs (DP)

The assessment team will prepare an Information Memorandum to the DP from the Director, Safeguards and Security, setting forth significant findings and recommended corrective actions.

6.3.7 Final Report Preparation

The assessment team will incorporate a digest and audit report with the field report. The digest describes the team's activities and highlights significant findings.

6.3.7.1 Distribution

The final report is forwarded under the signature of the Director, Safeguards and Security, Headquarters, to the field office manager, with copies to the appropriate Assistant Secretary, the Inspector General, and applicable program divisions.

6.3.8 Followup

The assessment team is responsible for advising the appropriate Headquarters office, including components within Safeguards and Security of deficiencies, including those which may require Headquarters policy guidance. In addition, other information or situations, not necessarily representing deficiencies but which may have a significant bearing on the safeguards and security program, should be brought to the attention of the responsible official. The assessment team also prepares the necessary input to the Assessments Branch computerized records system (Assessments Information System), to ensure that appropriate followup action occurs.

6.4 AREA OFFICE REVIEWS

An Area Office review may be conducted as an integral part of a comprehensive assessment or may be conducted separately in accordance with annual schedule demands and manpower availability. When conducted separately, the results of the review will be documented and briefed to the Area Office management prior to departure of the team from the office.

6.4.1 Preparation and Coordination

Preparation and coordination procedures prior to the review shall be as indicated for the comprehensive assessment in Sections 6.3.1 and 6.3.2. Repre-

sentatives from the Safeguards and Security Division of the cognizant Operations Office will be requested to participate in the review.

6.4.2 Scope of the Review

As indicated in Section 6.1.2, the cognizant Operations Office typically delegates the administration of one or more safeguards disciplines to an Area Office. Accordingly, the review will cover at least, but will not necessarily be limited to, the disciplines so delegated. The choice of team members and the size of the team should be commensurate with the safeguards coverage required.

6.4.3 Conclusions and Documentation of the Review

The results and conclusions of the review will be documented in accordance with the format specified in Section 6.3.4. A closeout briefing with the Area Office Manager will be held with Safeguards and Security representatives of the cognizant Operations Office in attendance.

6.4.3.1 Reports

When an Area Office review is conducted separately from a comprehensive assessment and deficiencies are noted in Categories I or II (see Section 6.3.6.1), the team leader will brief the Director, Safeguards and Security, Headquarters, on significant findings and problem areas as indicated in Section 6.3.6. An information memorandum to the Assistant Secretary for Defense Programs (DP) will be prepared as indicated in Section 6.3.6.2.

6.4.3.2 Final Report

The report prepared in the field for use in briefing the Area Office Manager will be held in Safeguards and Security, Headquarters, until the completion of the annual comprehensive assessment of the cognizant operations office and incorporated as an integral part of that final report.

6.5 FIELD OFFICE SURVEY PARTICIPATION

Section 6.1.3 briefly describes the activities of the Assessments Branch in participating with a field office (usually an Operations Office) when conducting a survey. Many field offices now conduct comprehensive surveys; that is, all aspects of the Safeguards and Security Program are surveyed as a single activity. Others conduct two surveys, however, one to review material control and material accountability aspects and the other to review physical security and security controls.

The Assessments Branch participates with the field office teams in conducting surveys from time to time.

6.5.1 Preliminary Information Review

Annually field offices are requested to submit their schedule for planned surveys. Based on a review of these schedules, the Assessments Branch prepares a schedule of surveys for its participation. Typically, the Branch participates in one survey per field office each year.

Information on the facility to be surveyed, which is available in Headquarters, is reviewed by the Assessments Branch staff member who is to participate. The facility safeguards and security plan is reviewed.

A detailed review of previous survey reports for the facility is conducted. The prior comprehensive Assessment report on the Operations Office is reviewed. Strengths and weaknesses in the Assessment report are noted for attention during the survey to determine whether needed corrections have been made.

A review is made of pertinent DOE IMDs with special attention to any recent changes.

6.5.2 Interaction with Operations Office

The proposed Assessments Branch participation is submitted to the Operations Office as part of the overall Assessment schedule. Approximately 30 days prior to the survey, the field office Director, Safeguards and Security, is contacted. The discipline to be reviewed by the Assessments Branch staff member is established and the participant is designated.

Details of the survey plan are obtained and logistical arrangements are made.

6.5.3 Participation Activities

The Assessments Branch participant is established as a working member of the survey team; but is not assigned individual responsibility for any area; rather, he works in support of the survey team always as a "second man." Routinely, the participant is scheduled to work with as many survey team members as possible.

The Assessments Branch participant assists the survey team in activities such as completing check lists, participating in planning and executing exercises, observing inventories, observing and assisting in inventory verification measurements.

At the conclusion of the survey participation, the Assessments Branch staff member will discuss his observations of strengths and weaknesses with the survey team leader.

6.5.3.1 Report on Participation

The Assessments Branch survey participant prepares a narrative report on his activities. The report contains a detailed discussion of all activities

in which he was involved and cites strengths or weaknesses noted. Particularly, the report notes responsiveness to findings made during Comprehensive Assessments.

Weaknesses which may be noted are identified for followup during the next scheduled Comprehensive Assessment. Any weakness which is determined to seriously jeopardize the effectiveness of the Safeguards and Security Program will be reported to the field office Safeguards and Security Director.

The narrative report will not be transmitted outside Safeguards and Security Headquarters.

6.5.4 Followup

Safeguards and Security's management, Headquarters, will be briefed by the Assessments Branch participant on the results of his activities. Any weakness determined to require immediate followup will be reviewed in detail and, with the concurrence of Safeguards and Security Headquarters, will be reported to the field office Safeguards and Security Director.

Any weakness not requiring immediate followup will be identified for review during the next Comprehensive Assessment of the field office.

6.5.4.1 Field Office Survey Report

The report prepared by the field office on the survey in which an Assessments Branch member participates will be reviewed by that Branch member. The review will evaluate the accuracy and completeness of the report based on the participation activities. Discrepancies will be noted for followup. The seriousness of a discrepancy will determine whether immediate action is taken or whether followup is deferred until the next Comprehensive Assessment.

6.5.4.2 Comprehensive Assessment Followup

The results of a survey participation are used to identify areas for emphasis during the subsequent comprehensive assessment. These areas are reviewed by techniques such as interviews, work paper reviews or onsite observations or testing.

6.6 SECURITY REVIEWS OF ENERGY RESEARCH CENTERS AND OTHER DOE ENERGY FACILITIES

A security review of Energy Research Centers and other DOE energy facilities may be conducted in conjunction with the annual surveys performed by the field offices. The purpose of such reviews are (1) to provide independent assurance that Government property and the health and safety of individuals are adequately protected, and (2) to familiarize Headquarters assessment personnel with the functions and security problems of these facilities.

6.6.1 Preparation and Coordination

The safeguards and security assessment representative will make arrangements for the visit with the facility to be assessed and will ensure that proper coordination is maintained with the responsible field office. Coordination may also be required with the appropriate safeguards and security office and Headquarters office having programmatic jurisdiction over the facility.

6.6.2 Scope of the Review

The review should ensure that all locations designated as "property protection areas" at the facility are checked for compliance with the requirements of IMD 6105 and, for additional measures which may be required due to the location and/or nature of the installation. Such things as value of Government property, threat assessment (actual experiences and potential), unique or specialized equipment or processes, and emergency plans and procedures should be considered. Discussions should be held with the head of the installation and the individual(s) assigned the responsibility for security.

6.6.3 Conclusion, Documentation, and Reports

The findings and any recommendations should be discussed with the facilities' security representative and higher management at the discretion of the team leader and a written report prepared. Its accuracy shall be attested to by the safeguards and security team leader and the responsible facility official. A copy of this report should be left with the facility.

Subsequent actions should include preparation of the security survey report by the responsible field office and preparation of a Headquarters report incorporating the report left with the facility. The latter report should be sent to the facility with information copies to the Office of the Inspector General, safeguards and security interested offices, and appropriate program offices. The facility should be requested to advise safeguards and security in writing of actions taken or contemplated with respect to any reported findings.

6.7 BILATERAL SAFEGUARDS INSPECTIONS

Bilateral safeguards inspections are conducted to verify the presence and use of nuclear materials and equipment supplied pursuant to an Agreement for Cooperation. As of April 15, 1978, there will be only one agreement remaining under which bilateral safeguards will be implemented. The remaining country in which inspections will be conducted is France. Material in France subject to safeguards inspections was supplied pursuant to the U.S./France Agreement for Cooperation for Mutual Defense Purposes. This material is intended for use only in the land-based submarine prototype program.

6.7.1 Preliminary Information Review

Preparation for a safeguards inspection begins with a review of information available in DOE. This information includes:

(1) Prior inspection reports.

(2) Material status reports - submitted monthly.

(3) Pertinent data in DOE correspondence files.

The review results in a plan for the inspection with rough schedule and activity program.

6.7.2 Coordination with DOE Headquarters Divisions and Other Government Agencies

The proposed schedule and activity program for the inspection is reviewed with DOE divisions sharing international responsibilities and a final schedule is developed. The inspection program and schedule is then prepared in cable format and, following DOE coordination, is submitted to the Department of State for coordination and transmission to the U.S. Embassy, Paris.

Upon receipt of the cable, the Embassy appoints a control officer who coordinates and arranges the inspection with the French Officials.

Arrangements are confirmed by return cable.

6.7.3 Coordination with Bilateral Country

The Embassy control officer informs the bilateral country officials about the proposed inspection activities and schedule. These officials handle arrangements for onsite inspection activities. The proposed schedule is either accepted or an alternate is suggested.

The information required to facilitate material record review and inspection activities is developed prior to arrival of the inspector if appropriate contact is made in Washington with the local Embassy office.

6.7.4 Preparation of Working Papers

When the schedule is established for an inspection, the working papers for the inspection may be prepared. These papers detail the plans for the inspection activities. Information on quantities and location of materials based on U.S. records updated by previous inspections and reports submitted is obtained from the NMMSS. Any differences between U.S. and bilateral records are identified for resolution during the inspection.

A detailed schedule is established which identifies the inspection meetings and activities to be conducted. Using this schedule, an outline is prepared for each inspection activity. The outline identifies the likely contacts and subjects to be raised. An inspection plan is prepared for each facility. This plan contains a brief description of the facility, the names and titles of expected facility officials and a summary of inspection activities conducted during the previous inspection. A plan is developed for activities to be conducted during the proposed inspection. Where possible, items to be sampled

for inventory verification are chosen using a random sampling plan. Data sheets for verification activities are prepared to facilitate orderly inspection conduct. The plan identifies also any unresolved problems or specific areas to be reviewed during the inspection.

The working papers are prepared to be used as a check list for the inspection. Typically, the papers are assembled so that notes on responses to questions may be made directly on the sheets. These sheets are preserved in the inspection file and are used in preparing the report and in planning the next inspection.

6.7.5 Initial In-Country Coordination

The inspection begins when the inspector or team arrives in the country to be inspected.

6.7.5.1 Embassy Contact

The U.S. Embassy establishes a control officer for the inspection. Typically, this is the Science Attache or the Science and Technology Counsellor (S&TC). The initial contact for the inspector is a meeting with the control officer. The items for discussion are included in the working papers. Items which will be raised with country officials are reviewed and logistics for the the inspection are arranged.

The instrument used for inventory verification is stored in the Embassy. The instrument is checked out during the inspector's visit to the Embassy.

An Embassy representative is invited to participate in inspection activities. Typically, the S&TC or a member of his staff attends the initial meeting with country officials. Occasionally, an Embassy representative participates in the inspection at one or more facilities.

6.7.5.2 Foreign Atomic Energy Authorities

An initial meeting is held with officials from the country's atomic energy organization. At this meeting, the planned inspection program is reviewed and items identified for discussion are raised. The officials review the status of the program and present a document summarizing the material accountability records. Final arrangements for escorts for the inspection are made and final logistical plans are established.

Provisional plans are made for a closeout meeting if the inspection discloses any areas requiring review and/or followup action.

6.7.6 Conduct of the Bilateral Inspection

The following are the activities conducted for a safeguards inspection. The inspection is a combination of material control and material accountability.

6.7.6.1 Records Review

Nuclear material accountability records are maintained by DOE through the NMMSS. These records are reconciled and updated by material status reports which are submitted routinely (monthly by France) from the recipient country. The U.S. records are used as the basis for the inspection. These records are compared to those maintained by the central records group. Any differences are identified and reconciled. When the total quantity figure is agreed upon, the central records are used to determine the breakdown of the total by facility. These records also provide data on material form and enrichment. The results of the records review are:

(1) A comparison of U.S. and local data.

(2) Reconciliation of any differences.

(3) A listing by form, enrichment, and facility of material to be accounted for.

6.7.6.2 Facility Inspection

The safeguards inspection is carried out on a facility-by-facility basis. The inspection at a facility consists of a review of local records; establishment of local inventory, observing inventory, verifying the inventory and reviewing the facility program. The facility inspection is based on, to the extent feasible, the inspection plan. Facility officials responsible for material accountability and for conducting the program are interviewed during the inspection.

6.7.6.2.1 Program Review. Material which is supplied under an agreement for cooperation is to be used only for an agreed program. During the inspection, discussions are held with facility officials to review the material use to determine that the program is consistent with the terms of the agreement. Aspects of the program which are considered include developments in the program since the previous inspection, status of the present program, and plans for the program until the next planned inspection. Specific consideration is given to loading and unloading fuel from a reactor and plans for changes in the established program.

6.7.6.2.2 Inventory and Verification. Information provided by the central material accountability records is compared with local accounting records. Any differences are reconciled. The local records are used to establish a listing of the facility inventory.

A tour is made of the facility to all material locations. Routinely, all items which can be identified by size, shape, or serial number are checked. Items which are not directly available, such as irradiated fuel elements, are observed and piece counted.

Verification of the inventory is conducted, if feasible, on the basis of the inspection plan. The inventory is stratified and a random sample is chosen.

The typical sample selection is made using a random number table or random numbers generated by a calculator.

The verification activities conducted include serial number checks and use of nondestructive assay equipment. The NDA when used is to verify the presence of SNM in items such as fuel plates or bulk containers. Where simple geometry is encountered, the NDA can, on an intercalibration basis, determine the quantity of SNM.

6.7.6.3 Initial Conclusions

At the end of the inspection, the initial conclusions drawn are informally given to the escort from the host country. If no problems requiring followup action are encountered, no formal closeout with other than the escorting official is held.

A briefing is given to the Embassy staff on the results of the inspection. Arrangements are made to supply the Embassy with a copy of the report prepared for the inspection.

6.7.7 Inspection Briefing to Safeguards and Security Headquarters

Upon return, the inspector prepares a briefing for Safeguards and Security management, Headquarters, on the inspection program and results. If any problems requiring followup action are developed during the inspection, plans for followup are discussed.

6.7.8 Report Preparation

The report of an inspection is in three parts, the Memorandum Report, the detailed report, and the Information Memorandum.

The Memorandum Report is a "quick turnaround" report. Within 1 week of the inspector's return, this report should be prepared and forwarded. This report is sent to the Assistant Director for Plans and Policy who, if appropriate, may forward it to upper Safeguards and Security management. This report briefly recounts the inspection activities and conclusions.

The detailed report contains information on all inspection activities. It contains reports on all meetings conducted and lists all persons contacted. The report describes the inspection and inventory verification activities and results. This document is intended to provide details to aid in planning for the subsequent inspection.

If an inspection identifies a problem requiring followup action which may involve higher levels of DOE management, an Information Memorandum to the ASDP is prepared.

6.7.9 Report Distribution

The Memorandum Report is distributed only within Safeguards and Security. The detailed report is distributed to the Embassy control officer and to other DOE divisions potentially using information in the report, e.g., Division of International Security Affairs.

6.8 INTERNATIONAL PHYSICAL SECURITY REVIEWS

Section 6.1.6 describes briefly the Assessments Branch activities in conducting international physical security reviews. These reviews are the implementation of a U.S. policy decision to export nuclear materials only when the physical protection to be afforded that material is deemed to be adequate. The Assessments Branch representative is a member of the review team who provides technical expertise in making the adequacy determination.

6.8.1 Coordination with International Security Affairs

The physical security reviews are an implementation of U.S. policy. International Security Affairs (ISA), DOE, coordinates this implementation with other Government agencies as well as within DOE.

The schedule for these reviews is prepared by ISA and coordinated with Safeguards and Security.

The team to conduct a review is designated. The team typically consists of one representative each from ISA, Safeguards and Security, and the Nuclear Regulatory Commission. On occasion, representatives from Arms Control and Disarmament Agency (ACDA) may participate.

When a country is designated for a physical security review, information available in DOE on that country is reviewed. This information includes:

(1) Status of membership in IAEA

(2) Status regarding adherence to NPT

(3) Nuclear program status

(4) Nuclear materials and facilities which have been previously supplied from the U.S.

(5) Present physical security guidelines, i.e., INFCIRC/225

(6) Present physical security requirements in the U.S.

6.8.2 Coordination in DOE and Other U.S. Government Agencies

In preparing for a review, Safeguards and Security in conjunction with ISA coordinates the review plans with other DOE organizations. Information available about the country nuclear program is obtained from DOE International Affairs. With ISA taking lead responsibility, briefings are held with other

Government agencies. These briefings provide the review team with background on the country to aid in defining the threat which the physical security program should address.

6.8.3 Coordination with Country Atomic Energy Authorities

Plans for conducting a physical security review are coordinated with country Atomic Energy Authorities through the U.S. Department of State and the in-country U.S. Embassy. The coordination includes establishing the schedule for the review and the facilities to be visited. Final review plans are made only after confirmation of acceptability to the host country is received.

6.8.4 Review Preparation

The Assessments Branch representative routinely takes the lead in preparing working papers for the review. These papers include:

(1) Nuclear program

(2) Country background

(3) Materials and facilities supplied

(4) Discussion outlines for meetings and facilities

(5) Review criteria

(6) Handouts for host officials:
    (a) U.S. regulations
    (b) U.S. review policy documentation.

A copy of the review paper is provided to each team member.

6.8.5 In-Country Coordination

The review team contacts the U.S. Embassy upon arrival in the country to be reviewed. Initial contact is through the designated Embassy visit control officer. A briefing is presented to this officer on the purpose and proposed review program. The officer is invited to participate in the review. Logistics for the review are arranged.

The team typically briefs the Ambassador or the Deputy Chief of the Mission. This briefing presents the background for the visit and describes the planned review program.

6.8.5.1 Atomic Energy Authorities

The review team next meets with Atomic Energy Authorities in the host country. During this meeting the team describes the purpose of the review and proposes facilities to be visited. A description of the U.S. physical security program is presented and the background for U.S. policy is set forth. Copies of pertinent documents which the team brings as handouts are given to authorities. The authorities are invited to send a team to the U.S. in furtherance

of a bilateral exchange to review the U.S. program, especially research and development in safeguards and security.

The team then requests the authorities to describe their program for physical security of nuclear materials and facilities. The perceived threat to be addressed by the program is discussed. The program discussed material in transit as well as materials for fixed facilities.

Authorities are asked whether the IAEA guide is used in developing the standards for their program and whether the program is based on specific national requirements. Plans for changes in the program are also requested.

6.8.6 Conduct of the Review

The review is conducted by discussions with Atomic Energy Authorities and by onsite reviews.

6.8.6.1 Atomic Energy Authority Discussions

Section 6.8.5.1 describes the information discussed with Atomic Energy Authorities. These discussions are intended to provide information on the present status and planned upgrading in the security program. These discussions also provide information on the feasibility of evaluating the adequacy of the national system for physical security based on visits to a sample of facilities.

Information on the program at both fixed facilities and for nuclear material in transit is obtained. Copies of national regulations, where possible, are obtained.

6.8.6.2 Facility Reviews

The team, usually accompanied by a local U.S. Embassy representative, visits nuclear facilities in the host country. Where feasible, only a sample of facilities in the country is visited. In many cases, all of the facilities are visited since many countries have only one or two nuclear facilities.

An outline of areas to be considered in the review is in the review work papers.

6.8.6.3 SNM Transportation Review

Routinely, the review of transportation security is based only on discussions with authorities and a review, where feasible, of national regulations. Where feasible, a review in greater depth may be conducted. This could include visits to receipts and transit locations and travelling the route followed for transportation. Inspection of vehicles used for shipments is made, if possible.

6.8.7 Informal Team Briefings

The team presents informal conclusions about the review to Atomic Energy Authorities and to U.S. Embassy representatives.

6.8.7.1 Conclusions to Atomic Energy Authorities

The team presents their conclusions informally to the Atomic Energy Authorities. In the event that a system is considered to be inadequate, measures necessary to acheive adequacy are recommended.

6.8.7.2 Conclusions to U.S. Embassy

The team informally briefs the local Embassy representative when the review program is considered to be adequate. However, if inadequacies are noted, a more formal presentation of the conclusions is given. In this case, measures needed to achieve adequacy are described. In some cases, the Ambassador requests a final team briefing on the team conclusions.

In cases of inadequacy, the team attempts to provide sufficient background information to permit a meaningful facility revisit by an Embassy official to verify when corrective actions have been taken.

6.8.8 Headquarters DOE Management Briefings

Upon return, the review team briefs appropriate DOE management representatives. The briefing presents the team activities and conclusions. In the event that a program is considered to be inadequate, deficiencies are described and the correction recommendations which were given host Government officials are set forth. The schedule for corrections and proposed followup actions are discussed.

6.8.9 Report Preparation

The review team leader coordinates among team members the responsibility for report preparation. There are two reports prepared for each review, a trip report and an evaluation report.

6.8.9.1 Trip Report

The trip report is a detailed diary-type report. One team member takes the lead in preparing this report, all team members provide information for the report. The trip report contains information on all review activities and the names of all contacts. This report is the background for the more structured evaluation report. The trip report typically is distributed only to team member organizations.

6.8.9.2 Evaluation Report

The lead for the preparation of the evaluation report is always taken by the ISA team member. The Safeguards and Security team member always has the

lead in preparing the program adequacy section of the evaluation report. This section describes the country program and evaluates its adequacy. The Safeguards and Security developed section is forwarded to ISA, where it is incorporated into the overall evaluation report.

The responsibility for preparing an Executive Summary for the evaluation report may rest on the Safeguards and Security team member. This summary briefly describes the review activities and significant conclusions.

6.8.9.3 Report Distribution

The review team trip report is limited in distribution to the team member organizations.

The Safeguards and Security section of the evaluation report is forwarded to ISA.

The evaluation report, which includes the Executive Summary, is distributed by ISA. This report is limited in distribution to ISA and Safeguards and Security with the action copy going through the DOE management chain to the Assistant Secretary for Defense Programs. From the Assistant Secretary, the report is submitted to the Department of State which coordinates the Executive Branch recommendation to the Nuclear Regulatory Commission for approval or denial of a proposed export license.

ANNEX A

GLOSSARY

Assessment. (1) Acquiring information on safeguards and security and (2) evaluating it, in order to measure system effectiveness.

Control. Measures directed toward things in order to deter, detect, and prevent the loss and willful misuse of matter (facilities, material, classified matter, and property).

Effectiveness of Performance. The degree to which program objectives are met.

Independent Location. SNM locations that are inspectable anytime, remote from similar SNM locations (miles apart or in a single building if occupied by more than one contractor), and susceptible to unauthorized diversion only through extensive collusion.

Integrity of Performance. The degree to which program requirements are implemented, compliance.

Inventory Stratum. An SNM inventory consisting of a single material form.

Level I - Assurance of Capability. Assurance that the safeguards and security measures in place and required are adequate against the defined threat.

Level II - Assurance of Performance. Assurance that the inherent capability is satisfactorily used.

Level III - Independent Assurance. Assurance at any organizational level derived from independently establishing the credibility of evidence used at lower levels to demonstrate integrity and effectiveness of performance.

Material Balance Area (MBA). An area within a facility, the material records for which are maintained in such a way that, at any time, a balance can be taken from the records to show the amount of material for which the area is responsible. The MBA's usually are based upon physical boundary delineations, types of process, or organizational lines.

Physical Protection. Measures directed toward people in order to deter, detect and prevent the loss and willful misuse of matter (facilities, material, classified matter, and property).

Substantiation Goal Quantity (SGQ). The SNM quantity whose potential loss the sampling plan is designed to detect with high probability. SGQ also is called the threshold amount, or simply goal quantity.

ANNEX B

CONCEPTUAL DEFINITIONS

B.1 CONCEPT OF DETERMINING VALUE

For all practical purposes the verbs "assess," "evaluate," and "appraise" are commonly used interchangeably to mean "to determine the value of or to put a value on."(3) There is some difference in the connotation of each of the three words. Appraisal carries the sense of expert judgment of value or merit--i.e., to appraise a car, a house or a work of art. Evaluate carries with it the implication of careful determination of value through a study of the factors involved with some type of scientific, or at least objective, appraisal or review. Assessment implies a concern with the process or the operations involved in determining value. Its use implies a primary concern with the procedures by which value is determined, as opposed to the cognitive basis for assigning the value.

In DSS, the word "assessment" is used to denote the process by which the integrity and effectiveness of safeguards and security related systems and practices are established to provide information on the status of established systems and practices, and a basis for determining necessary changes in requirements. It implies the critical examination, analysis, and evaluation necessary to judge the effectiveness of the system. "Appraisal" is reserved for judging the technical and administrative effectiveness of individuals and components and is inherently a managerial responsibility. "Evaluation" is used in the somewhat narrow sense of that part of the assessment process that involves relating the results of information collection and data analysis to the defined objective so as actually to place a "value" on the effectiveness of the effort. It is generally used as complementing survey and inspection activity.

B.2 CONCEPT OF THE CONTROL PROCESS

Another concept associated with assessments or evaluations is designated by "control" words like direct, manage, administer, supervise, oversee.

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(3) There are several other words which have more specific meanings that may also be considered synonyms. One of these is the word "assay," which in the narrow sense is the measurement of a predetermined characteristic. Another is the word "rate" which can involve either the concept of a "grade" or the concept of "esteem." Finally, there is the word "estimate" which appears frequently as a synonym, but unfortunately has acquired (perhaps from statistics) a connotation of uncertainty or unreliability that was not in the usual meaning of the word. All these words have to do with the concept of establishing or determining value, but are not commonly used in connection with assessment practices as applied to safeguards or, more generally, in the context of evaluation research.

These are divided into two subclasses. One subclass involving directors and administrators has in it the sense of "management" and involves decision or the need to handle or change something, as opposed merely to acting on established principles as in the case of a supervisor or overseer. A related set of words is used to connote only observation. Strictly, the word monitor implies simply watching, auditing or listening--i.e., simply receiving or noting a signal with no associated action or response. Similarly, one usage of the word "review" is simply to mean a survey or examination which has in it a sense of judgment or warning, while a review can involve a critique or criticism, as in the review of an article or book. Both words may carry a sense of judgment as well as observation, but not usually action.

All management processes involve some level of measurement and feedback of performance. The relationship to the responsibilities of contractors, field offices, and headquarters personnel is discussed in Section 2.0 of this report, based on established organizational concepts.

B.3 CONCEPT OF ASSURANCE

Finally, there's a whole set of synonyms and usages that arise in connection with the word "assurance." One usage has to do with the sense of certainty--i.e., assure means to give confidence, to convince somebody by argument or proof, to make certain, to inform positively. The central idea is the creation of freedom from doubt. There is another set of meanings and usages associated with reassurance--i.e., creating freedom from self-doubt. And finally, there are usages which involve vows or promises to do something. Thus, assurance can imply certification and warranty, or reassurance and encouragement, or the obligation to undertake or do something. The first of the above interpretations is the common safeguards related usage, in that the objective of safeguards is to provide confirmation and certification of the presence of the nuclear materials for which a contractor or licensee is responsible and confidence regarding the ability of the system adequately to protect materials and facilities.

ANNEX C

CONTROL OF NUCLEAR FACILITIES AND CLASSIFIED INFORMATION

MANUAL TITLE	IMD/MC
Security Survey and Facility Approval	2001
Security Appraisals and Inspections	2002
Control of Classified Information	2101
Control of Information for Official Use Only	2104
Control of Classified Documents	2105 (& Appendix)
Weapon Data	2108
Security Education and Training	2201
Personnel Security Program	2301
Physical Protection of Classified Matter and Information	6102
Physical Protection of Unclassified Special Nuclear Material	6103
Control of Visits	2501
Unofficial Travel to Soviet-Bloc Countries	2502
Violations of Laws and Losses of Security Interest	2601
Communications Security	2701
Security of Automatic Data Processing Systems	2703
Control and Accountability of Nuclear Materials	6104
Physical Protection of DOE Property	6105

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