NUREG/CR-1258 Vol. 2
UCID-18123-79-4

Inspection Methods for Physical Protection Project:

Annual Report, March 1979 through February 1980

R. T. Bradley, D. D. Bowden, A. W. Olson, F. Rogue,
J. W. Savage, S. Scala

Lawrence Livermore Laboratory

Prepared for
U.S. Nuclear Regulatory
Commission

Available from

GPO Sales Program
Division of Technical Information and Document Control
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Printed copy price: _____

and

National Technical Information Service
Springfield, Virginia 22161

NUREG/CR-1258 Vol. 2
UCIL-18123-79-4
RS

Inspection Methods for Physical Protection Project:

Annual Report, March 1979 through February 1980

Manuscript Completed: March 1980
Date Published: June 1980

Prepared by:
R. T. Bradley, D. D. Bowden, A. W. Olson, F. Rogue,
J. W. Savage, S. Scala

Lawrence Livermore Laboratory
7000 East Avenue
Livermore, CA 94550

Prepared for
Division of Safeguards, Fuel Cycle,
and Environmental Research
Office of Nuclear Regulatory Research
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555
NRC FIN No. A-0143

FOREWORD

At the request of the Office of Nuclear Regulatory Research of the U.S. Nuclear Regulatory Commission (NRC), the Lawrence Livermore National Laboratory (LLL) has initiated the Inspection Methods for Physical Protection (IMPP) project for the NRC Office of Inspection and Enforcement (IE). The IMPP project team is studying the physical protection systems used by NRC licensees and the methods presently used by IE physical protection inspectors to inspect such systems.

The intended result of this effort is production of improved NRC inspection methods and improved inspector training. The benefit to the licensees will be more uniform inspections, more knowledgeable inspectors, and--we anticipate--more cost-effective physical protection systems.

The work of the IMPP project is supported by the NRC under a Memorandum of Understanding with the U.S. Department of Energy (DOE). The NRC work order is FIN A-0143.

LLL was established by the U.S. Atomic Energy Commission (AEC) and is operated by the University of California as one of the two national laboratories charged with the design and testing of nuclear weapons. With the advent of the energy shortage, DOE has broadened our mission at LLL to cover research and development in all aspects of energy, including solar, wind, geothermal, and fossil fuel, as well as commercial nuclear energy. As part of this broadened energy mission, we provide research, development, and technical guidance to the NRC in areas such as waste management, operating safety, seismic safety, and safeguards.

CONTENTS

LIST OF FIGURES

ABSTRACT

This is the annual report to the U.S. Nuclear Regulatory Commission (NRC) of progress at Lawrence Livermore National Laboratory (LLL) during the first year of the Inspection Methods for Physical Protection project. This report details the activities of the first year of work that culminated in delivery of field-test drafts of new procedures for inspecting the physical protection systems at nuclear power reactor sites.

SUMMARY

The worldwide upswelling of terrorist activities and the possibility of anti-nuclear terrorism has required an upgrading of protective systems used by nuclear facilities. The explosive growth in physical protection technology, the growing number of nuclear facilities, the increasing transportation of nuclear materials, and the upgraded physical protection regulations have had a major impact on the inspection procedures used by the U.S. Nuclear Regulatory Commission (NRC) Office of Inspection and Enforcement (IE). The Code of Federal Regulations for the physical protection of nuclear facilities is performance oriented, and therefore each inspection is site specific. The demands on the time of the inspector conducting an inspection, as well as the demands of keeping current with the sophisticated new physical protection systems, called for a review and upgrading of present inspection methods and inspector training.

Lawrence Livermore National Laboratory (LLL), under contract to the NRC Office of Nuclear Regulatory Research (RES), is providing the IE physical protection inspector with systems engineered guidance and methods suitable to field inspection needs. The needs are:

- To develop an evaluation methodology that integrates people, equipment, and procedures for inspecting physical protection systems.

- To provide systems engineered technical guidance and supplemental information for assessing the adequacy of physical protection systems.

- To develop inspection guidance and methods for evaluating compliance to regulations, as well as recommending sample size, manpower needs, and inspection equipment to be used.

- To develop inspection procedures for evaluating licensee implementation of guard training and qualification plans (Appendix B of 10 CFR Part 73) and contingency plans (Appendix C of 10 CFR Part 73).

- To provide ready reference materials, such as pertinent extracts from regulations, staff position documents, and industrial/commercial standards.

- To provide inspector training in the application of the upgraded inspection guidance and methods developed by LLL.

To fulfill these needs, RES instituted the Inspection Methods for Physical Protection (IMPP) project at LLL. This project logically evolves into two phases: a data acquisition phase and the production of deliverables phase. The data acquisition phase consists of reviewing government and commercial physical protection equipment and literature, participating in IE inspections, and interacting closely and frequently with NRC headquarters and Region offices. We continually study the Code of Federal Regulations, Regulatory Guides, and other NRC staff position documents to assure that the guidance developed for the deliverables can be used to inspect for compliance.

The production of deliverables phase, which is still ongoing, consists of applying systems engineering concepts to the guidance, methodologies, pertinent information, and criteria provided to the inspector. The original IMPP project tasks of upgrading and updating existing NRC physical protection equipment catalogs and equipment evaluation guides were redirected midway in the first project year to amended tasks of developing new IE physical protection inspection modules to replace the IE modules presently used. We delivered field test drafts of a new inspection module for power reactor physical protection to NRC at the end of the first project year. During the next year we will develop IE physical inspection modules for non-power reactors, fuel cycle facilities, and transportation of nuclear material, as well as procedures for evaluating licensee implementation of guard training and qualification plans and contingency plans.

The ultimate goal of both LLL and RES is to improve the inspection process and lighten the inspector burden, while leaving inspector flexibility and initiative intact.

INTRODUCTION

The worldwide upswelling of terrorist activities as a means of achieving socio-political goals and the likelihood of anti-nuclear activists using terrorist tactics to achieve their goal of impeding nuclear technology has required upgrading of the protective systems used by nuclear facilities.

The Federal Government has mandated an upgrading of the physical protection systems at all nuclear facilities in the United States and has charged the U.S. Nuclear Regulatory Commission (NRC) with enforcing the upgrade. The NRC Office of Inspection and Enforcement (IE) is responsible for evaluating compliance with new physical protection upgrade rules and for assessing the adequacy of physical protection systems, including people, procedures, and equipment, that are implemented to meet the new rules.

The explosive growth in physical protection technology, the increasing number of nuclear facilities, the expanding transportation of nuclear materials, and the physical protection upgrade rules have had a major impact on the inspection and enforcement activities of IE. The new physical protection upgrade rules in the Code of Federal Regulations for nuclear facilities are performance oriented, and therefore each inspection is site-specific. The demands on the time of the inspector and the demands of keeping current with the sophisticated new physical protection systems called for a review and upgrading of current inspection methods and for upgrading the inspector's technical knowledge.

The Lawrence Livermore National Laboratory (LLL) has initiated the Inspection Methods for Physical Protection (IMPP) project under contract to the NRC Office of Nuclear Regulatory Research (RES) to provide IE inspectors with technical guidance, improved inspection methods, and technical training in the application of the guidance and methods.

IMPP PROJECT TASK CHANGES

ORIGINAL TASKS

Several of the original tasks of the IMPP project (see Appendix A) were to study and assimilate the vast body of information on physical protection systems already existing within governmental organizations and at nuclear facilities. The IMPP project was to repackage that information in a form that would be readily usable in the field by an IE inspector.

Other tasks were to use this repackaged information as a basis for providing improved methods for evaluating physical protection system equipment for compliance with regulatory requirements and for assessing the adequacy of the equipment installation.

It soon became apparent to both the IMPP project team and to IE that the physical protection upgrade rules for nuclear facilities influenced more than changes to equipment. IE needed improved methods for inspecting personnel and procedures as well as the equipment used to implement the new rules.

While many of the original tasks and deliverables would remain relatively unchanged, IE, RES, and the IMPP project team agreed to redirect the major part of the project effort toward revising of the inspection procedures in the existing IE physical protection inspection modules.

AMENDED TASKS

After several management meetings between the IMPP team, RES, and IE, the amended tasks (see Appendix B) were instituted. The relationship between the original tasks and the amended tasks is shown in Figures 1 through 4. Since the information input for the first six of the original tasks was nearly complete and was directly usable for the amended tasks, those original tasks were left relatively unchanged.

The major new item in the amended tasks for the IMPP project was to develop new inspection methods and guidance containing pertinent, usable

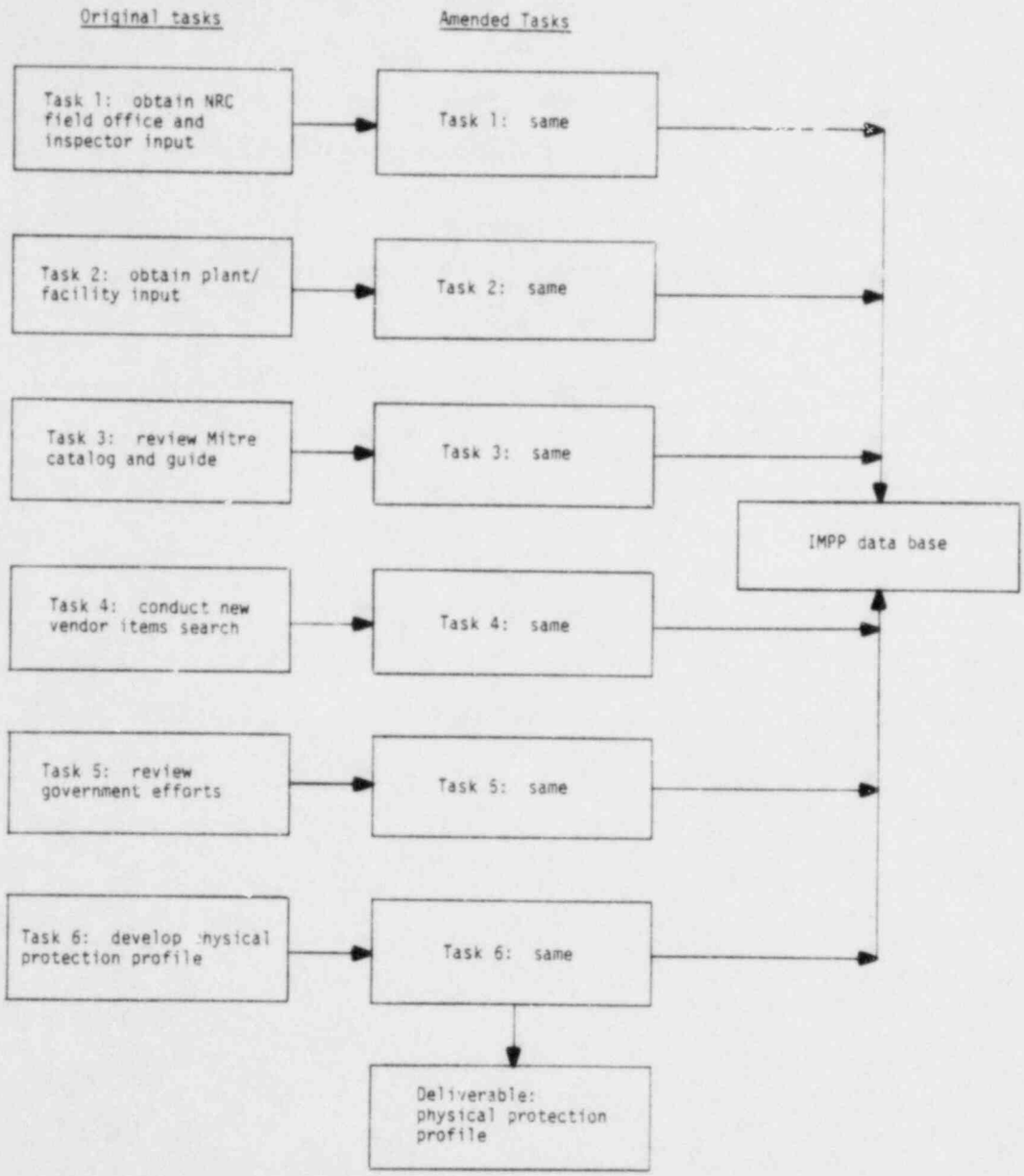

FIG. 1. Input tasks: relationship between original and amended tasks.

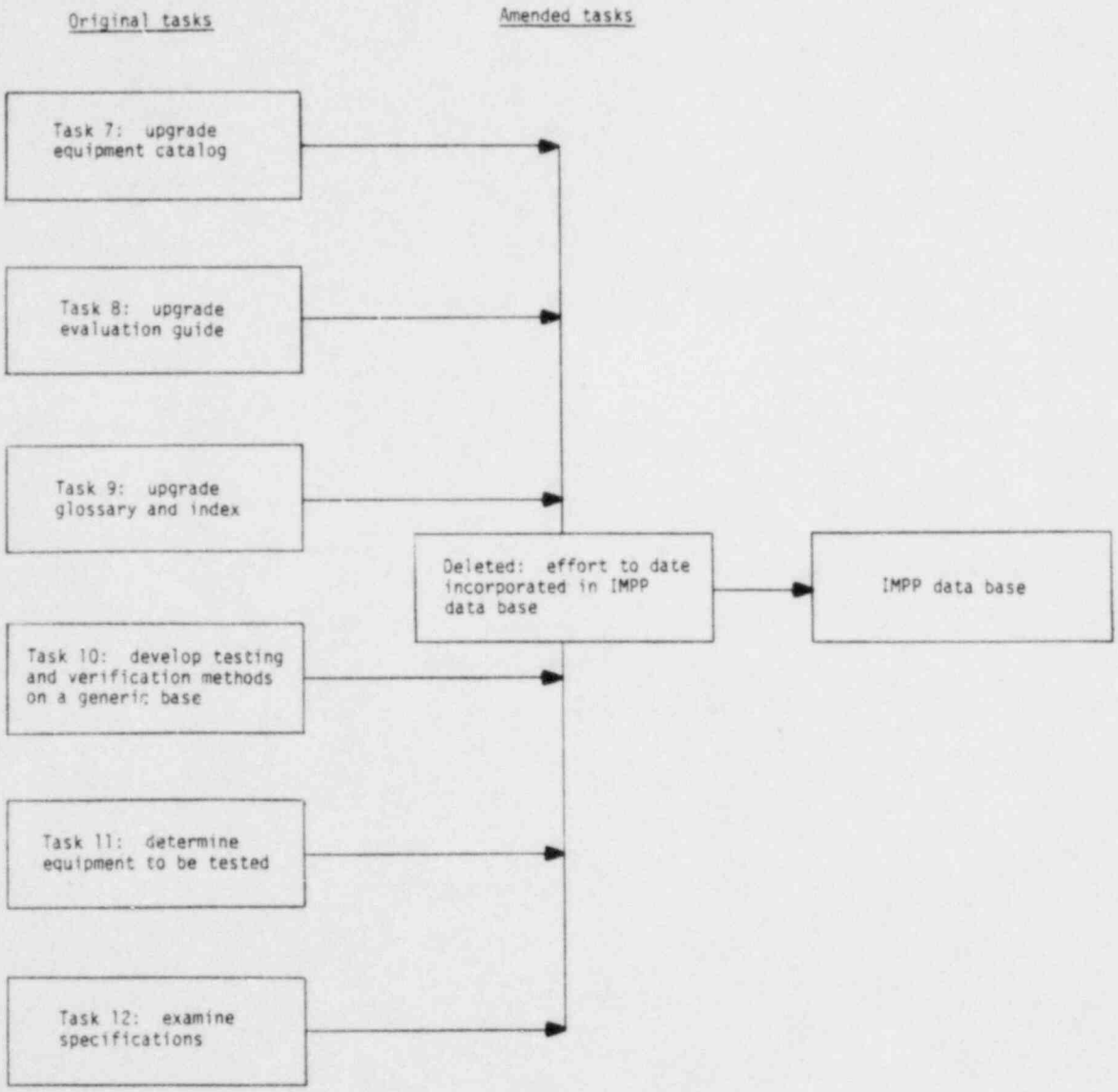

FIG. 2. Deleted tasks: relationship between original and amended tasks.

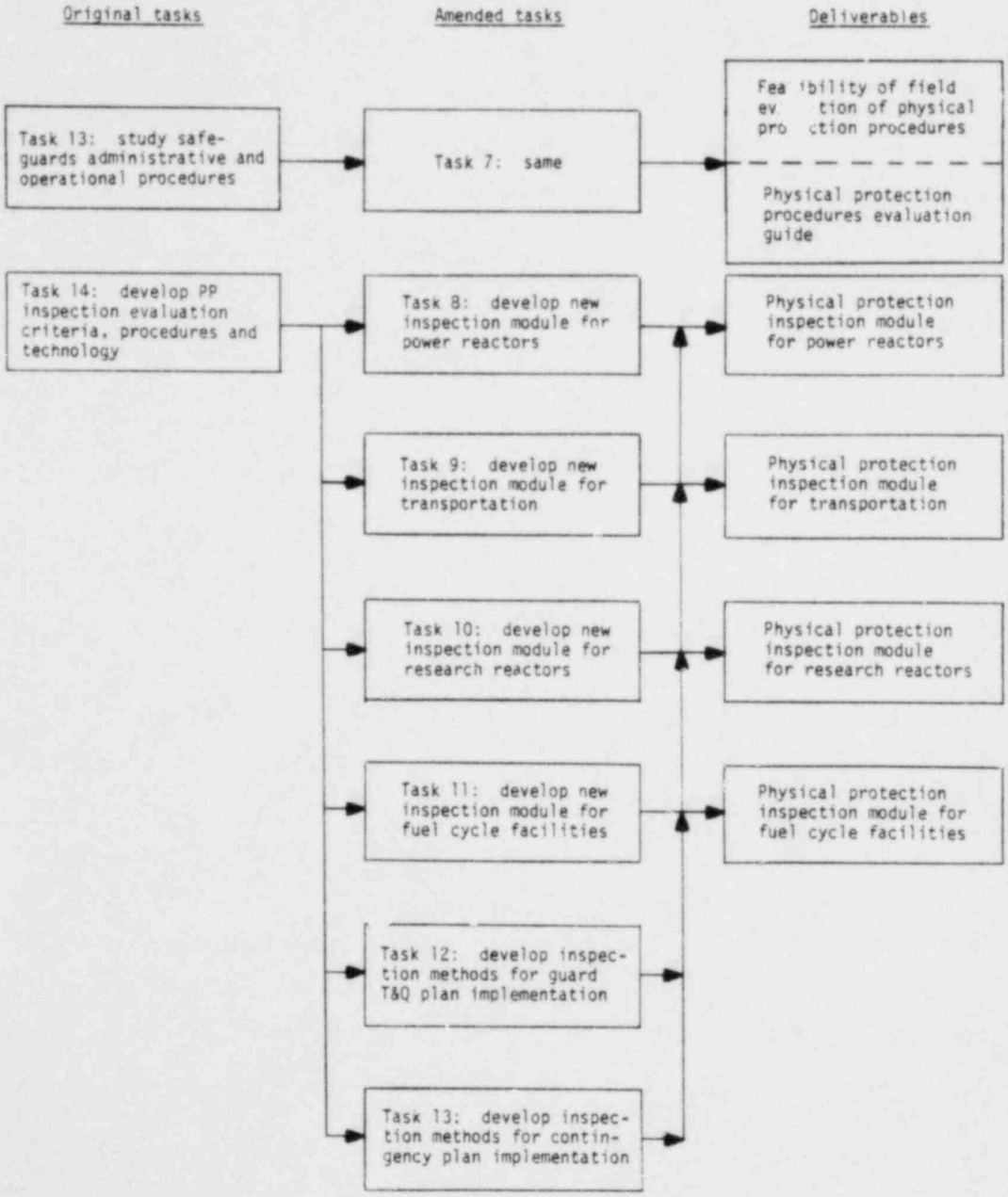

FIG. 3. Changed tasks and new tasks: relationship between original and amended tasks.

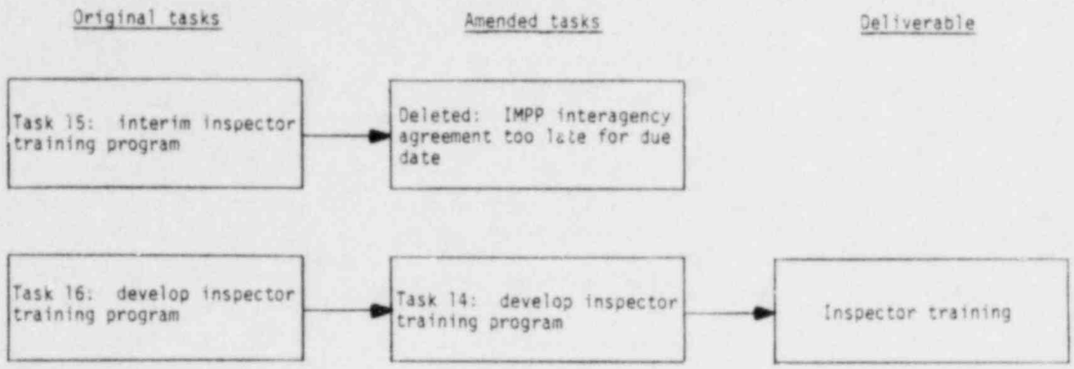

FIG. 4. Changed tasks: relationship between original and amended tasks.

technical information. We were to rewrite the following IE physical protection inspection modules.

- Power reactors (81100 series procedures)
- Fuel cycle/fixed site facilities (81200 series procedures)
- Transportation of nuclear material (81300 series procedures)
- Non-power/research reactors (81400 series procedures)

IMPP PROJECT ACTIVITIES,
MARCH 1979 THROUGH FEBRUARY 1980

Although we discuss IMPP project tasks separately, the activities of most tasks impact several other tasks.

Tasks 1 through 5 constitute the data acquisition phase of the IMPP project. While our data base is relatively complete at this time, we will continue to acquire new data throughout the life of the project. All such new information will be incorporated into our deliverables as appropriate.

Tasks 6 through 14 deal with the production of deliverables. It is inevitable that, in the effort to produce the deliverables, we will discover holes in our data base that will require additional data acquisition.

TASK 1 OBTAIN NRC FIELD OFFICE AND INSPECTOR INPUT

This task obtained inputs from NRC Region offices and from physical protection inspectors. In regions other than Region 5, most of our inputs were obtained during trips made by IMPP team members to observe IE physical protection inspections (see Table 1).

TABLE 1. IMPP Data Acquisition Trips

Date	Facility	Purpose
Feb. '79	NRC RES Office, Washington, D.C.	IMPP project calibration
Feb. '79	San Onofre Station, Region 5	Observe inspection
Feb. '79	Dresden Station, Region 3	Observe inspection
Feb. '79	Morris Spent Fuel Facility, Region 3	General familiarization
May '79	Zion Station, Region 3	Equipment survey field-test
May '79	AGNS-Barnwell Facility, Region 2	Equipment survey field-test
May '79	Wood River Junction/Dulles Airport, Region 1	Observe transportation of SSNM
Sep. '79	Millstone Station, Region 1	Observe inspection
Sep. '79	Region 3 Office	Data acquisition on A & O procedures
Oct. '79	North Anna Station, Region 2	Observe inspection
Oct. '79	Region 1, 2, and 3 Offices	Discussions on inspector training
Oct. '79	St. Lucie Station, Region 2	Observe inspection
Nov. '79	Apollo Fuel Facility, Region 1	Observe inspection
Dec. '79	Ft. St. Vrain Station, Region 4	Field-test first inspection procedures
Dec. '79	Humboldt Bay Station, Region 5	Field-test first inspection procedures

We have made extensive use of the physical protection section chiefs and inspectors who were appointed to be our contacts in each NRC Region office. They have been outstanding in providing the IMPP team with a clear picture of both the inspection process and the inspector's needs.

We want especially to acknowledge the help received from our contacts in the Region 5 office who get most of our queries because of their proximity to LLL.

Our Region contacts during the first year have been:

- Region 1: Jim Devlin
- Region 2: Ken Besecker
- Region 3: Jim Donahue
- Region 4: Ron Caldwell
- Region 5: Wayne Mortensen
  Levyn Ivey

Power Reactor Inspections

Members of the IMPP team observed physical protection inspections at seven power reactor sites during the first project year. The trip reports returned from our first two inspections at San Onofre Station and Dresden Station were so divergent that we felt the need for more than two datum points to complete our picture of the inspector, the inspection process, and the physical protection systems used by power reactor sites. Each of the IMPP team members has now observed inspections of at least two power reactor sites, and the composite formed from the seven trip reports has provided us with an overview of power reactor inspections shown in Figures 5 through 7 and as follows:

- The physical protection equipment used by the power reactor sites observed was limited to a narrow range of generic varieties.

- The quality of the equipment installation was varied, and often was considered inadequate by the IMPP observer.

- Many of the power reactor sites visited had not completed their implementation of the 10 CFR 73.55 upgrade.

- The facility's NRC approved physical security plan (PSP) is the primary document referenced when evaluating for compliance.

- The inspectors are dedicated professionals who believe in the necessity of adequate physical protection of nuclear facilities.

- The inspectors have diverse backgrounds, and they tend to inspect most heavily in the areas of their own expertise.

- The inspectors expressed a need for more technical knowledge about the equipment-oriented areas of physical protection systems, and they wanted technical reference material that can be used easily in the field.

- Most inspectors are at ease with the paper phases of their inspections. While they did not spend much time analyzing the licensee's implementing and support procedures, they expressed a desire for a field-usable methodology for such analysis.

- Most inspectors regard computer-based physical protection systems as being very hard to evaluate in-depth. They have requested guidance for evaluating the computer portion of the system.

- The inspectors have expressed that whatever help the IMPP project provides to IE, that help must contain inspection methods and technical guidance that are practical, realistic, and usable in the field.

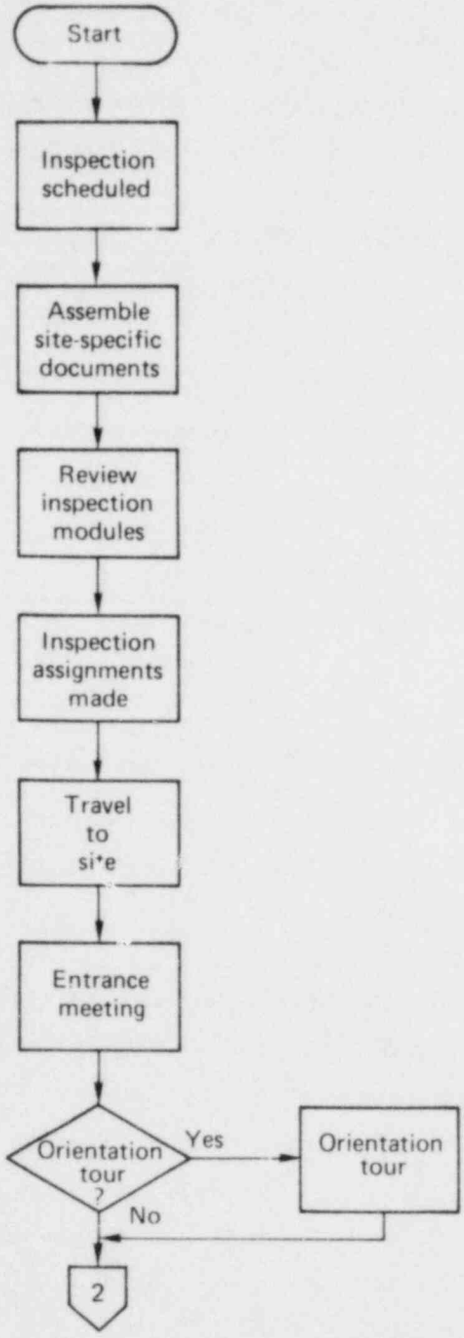

FIG. 5. Preinspection process.

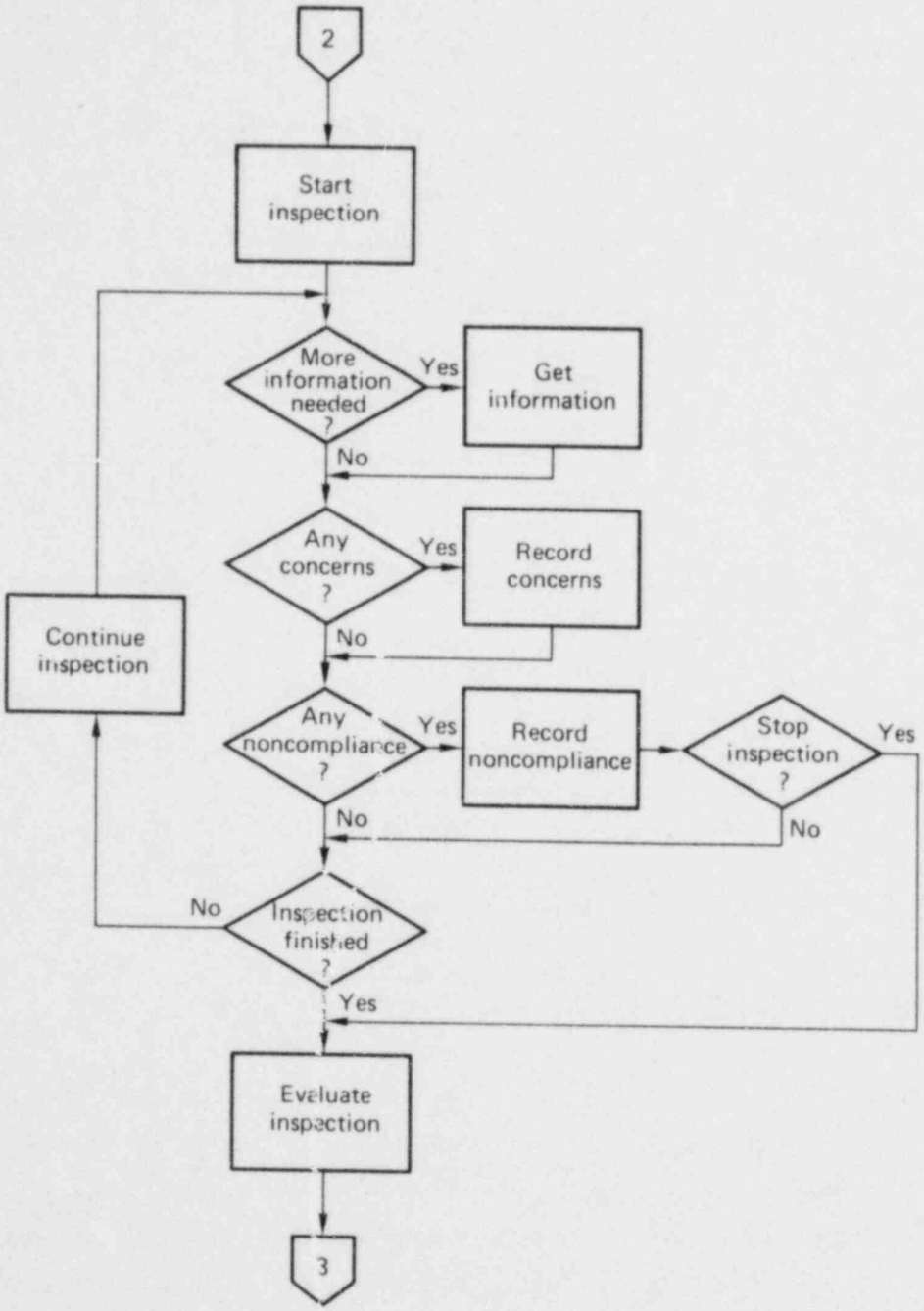

FIG. 6. Inspection process.

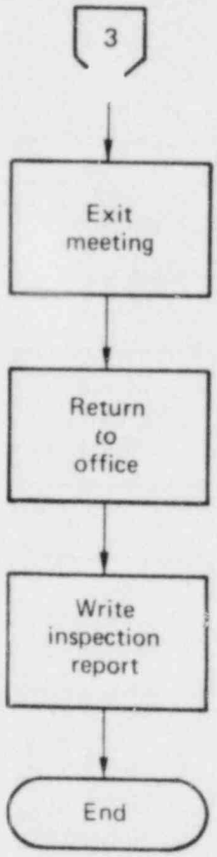

FIG. 7. Postinspection process.

Research Reactor Inspections

Only one observation of a research reactor inspection was scheduled for the IMPP team. Events within the nuclear industry caused IE to reschedule other planned observation trips, which prevented our observation of the research reactor inspection. Consequently, the IMPP team has not observed any research reactor inspections to date, and we need the information that could be obtained from such observations.

Fuel Cycle Facility Inspections

The IMPP team has observed only one fuel cycle facility inspection, and this was at a facility being decommissioned. We learned that the inspection process used for fuel cycle facilities is closely related to power reactor inspections. We also learned that some fuel cycle PSPs are classified documents.

The IMPP team needs to observe several more fuel cycle facility inspections.

Transportation Inspections

The IMPP team has observed only one inspection of a transportation activity, and this was the transportation of SSNM between Wood River Junction, RI and Dulles International Airport, VA. Although this inspection represents only one, possibly atypical datum, we observed the following:

- Transportation of SSNM is 100% inspected from beginning to end, with the SSNM transportation vehicle under observation by the inspectors at all times.

- The inspectors were poorly equipped for this particular inspection. Their vehicle was inadequate and they had no enroute communication with either the transport vehicle or the escort force.

We have had no opportunity to observe transportation of other types of nuclear material such as special nuclear material of moderate or low stragetic significance, fresh fuel, spent fuel, waste, or isotopes.

TASK 2 OBTAIN PLANT/FACILITY INPUT

This task obtained plant and facility input. Most of the information that we acquired is covered in the previous discussion of the physical protection

inspections observed by the IMPP team. However, the following is our general overview of the physical protection systems used by the nuclear facilities that we have visited.

- Management attitudes toward the physical protection upgrade rules varied from ready acquiescence to moderate resistance. Some security supervisors were very cooperative with the inspectors, while others were less than cooperative in the inspection process.

- Most of the equipment-oriented physical protection systems were installed by vendor-contractors as a purchased package. The performance quality of these packaged systems as installed was generally low, forcing the licensee to perform extensive postinstallation rework.

- We seldom found redundancy in intrusion detection systems or physical barriers.

- As mentioned previously, few of the facilities had fully implemented the upgrade rules at the time of our visits.

- Many of the power reactor sites had followed the format of the Security Plan Evaluation Report (SPER) Workbook when writing their physical security plan. Following the SPER format made it difficult to find the necessary information in the PSP during inspection.

- The high turnover rate within the contract guard force used in most nuclear facilities could be the Achilles heel in their physical protection systems.

TASK 3 REVIEW MITRE CATALOG AND GUIDE

This task constituted a review of the physical protection equipment documents produced by MITRE Corporation for NRC. These were:

- NUREG-0271 Physical Protection Equipment Study

- NUREG-0272 Cross-Reference Index for Equipment Catalog and Evaluation Guide

- NUREG-0273 Guide for the Evaluation of Physical Protection Equipment

- NUREG-0274 Catalog of Physical Protection Equipment

Three of the original IMPP project tasks involved reworking and updating these documents, but these tasks were deleted in the amended tasks. However the information gained from this review task is useful to the amended tasks of producing the new IE inspection modules.

Our review of the MITRE documents has left us with the following impressions:

- While the MITRE documents are a monumental work, especially considering the time constraints imposed on their production, the information that they contain is not in a form or format that is usable in the field during an inspection.

- Much of the equipment listed in the equipment catalog appears to be one of a kind, that is--the manufacturer will design and build the first unit of its kind in his garage workshop when he receives your order.

TASK 4 OBTAIN DATA ON NEW PHYSICAL PROTECTION EQUIPMENT

This task entailed a search for new physical protection equipment coming onto the market by reviewing vendor advertising and catalogs. This search is needed as a continuing effort during the IMPP project to assure that our deliverables cover all new physical protection technologies as they emerge.

TASK 5 REVIEW GOVERNMENT EFFORTS

This task was a review of the efforts of other governmental agencies in the field of physical protection. By using IE's microfiche library, the Government-Industry Data Exchange Program (GIDEP), the Department of Energy (DOE) Technical Information Center, and LLL's own extensive security library, we feel that we are current with the published activities of both governmental in-house and contracted physical protection efforts. As with the MITRE documents mentioned earlier, most of the documents resulting from governmental physical protection efforts are not in a form or format usable in the field during an inspection.

TASK 6 PHYSICAL PROTECTION PROFILE

This task was to develop a profile of the physical protection systems and equipment used by each generic type of NRC licensed nuclear facility. To acquire the data for these physical protection profiles, the IMPP team devised a physical protection equipment survey questionnaire for RES and IE that was to be sent to all NRC licensed facilities.

RES and IE arranged for trial runs of this survey questionnaire at the AGNS Barnwell facility and at Zion Station. Members of the IMPP team visited each facility to explain both the purpose of the survey and its use. We then modified the questionnaire based upon the comments received at these two trials.

RES and IE chose to distribute the questionnaire only to power and non-power/research reactors until several questions about the upgrade rules were resolved.

In September 1979, a letter from Jay Durst, Assistant Director for Safeguards and Systems Performance Research, Division of Safeguards, Fuel Cycle, and Environmental Research, RES, requesting licensee response to the physical protection equipment survey was mailed with the survey questionnaire to each power and non-power/research reactor facility. The completed questionnaires were to be mailed to LLL by the licensees.

We received completed survey questionnaires from 9 of the 48 power reactor sites and from 20 of the 59 non-power reactor sites. This low number of returns is insufficient for developing the physical protection profiles for these facilities.

At the request of RES and IE, the IMPP team developed and submitted a draft of a short-form physical protection equipment survey questionnaire designed for inspectors to collect the necessary information for the profiles during normal physical protection inspections.

TASK 7 A&O PROCEDURES

This task studied methods of evaluating the licensees' administrative and operational procedures used in physical protection to determine whether further work would yield a significant payoff.

An early result of this study revealed that applying the terms "administrative" and "operational" to procedures used by physical protection systems is less descriptive than applying the terms "implementing" and "support" for these procedures: implementing procedures directly execute the elements of the physical security plan; support procedures provide the precursors and the logistics for the implementing procedures.

In November 1979 we submitted a draft of our report on this study, The Feasibility of Field Evaluation of Physical Protection Procedures, to RES and IE for review and comment. We incorporated several recommended changes, and the report is being prepared for publication as NUREG/CR-1315 (UCRL 52740).

As a follow-on to the feasibility work, we are developing a methodology to determine which implementing and support procedures are necessary for the proper operation of the type of physical protection systems used by each facility. We are also developing a methodology for assessing the adequacy of implementing and support procedures.

TASK 8 POWER REACTOR MODULE

This task developed a new IE physical protection inspection module for power reactors to replace the existing 81100 series module. This new module

consists of the 23 power reactor inspection procedures shown in Table 2. The letter X in the procedure number will change to a number assigned by IE when the draft module is approved.

We have delivered drafts of the power reactor inspection module to RES, IE headquarters, and to the Region offices for review, critique, and field test. Note that two procedures for inspecting contingency plans and guard training qualification plans were not included in the draft module delivered. The two procedures must await pending NRC decisions on the license approval process and the development of review and acceptance criteria for these two plans. The discussions of Tasks 12 and 13 will provide more information on these procedures.

TABLE 2. The new IE physical protection inspection module procedures for power reactors

81X10	Preinspection	81X54	Physical barriers--vital area
81X14	Site orientation	81X58	Security system power supply
81X18	Security plan and implementing procedures	81X62	Lighting
81X22	Contingency plan	81X66	Assessment Aids
81X26	Guard training and qualification plan	8.X70	Access control--personnel
81X30	Security organization	81X72	Access control--packages
81X34	Security program audit	81X74	Access control--vehicles
81X38	Records and reports	81X78	Detection aids--protected area
81X42	Testing and maintenance	81X80	Detection aids--vital area
81X46	Locks, keys, and combinations	81X84	Alarm stations
81X52	Physical barriers--protected area	81X88	Communications
		81X90	Postinspection

Module Design Criteria

From what we have observed and read and from what inspectors have told us about the physical protection inspection process, we have adopted the following module design criteria:

- The most basic criteria in designing our physical protection inspection modules is that they must contain methods and guidance that are practical, realistic, and usable by inspectors who have had NRC training. The requirements of the inspection process and of the individual inspector are paramount.

- The inspection methods and guidance should be broad enough to cover any part of a physical protection system that the inspector might reasonably be expected to encounter. The choice of methods in a given situation is to be left to the discretion of the inspector, governed by site-specific considerations and the facility's physical security plan. We expect the inspector to use his initiative to the maximum--we don't advocate by-the-book applications of our modules.

- All pertinent regulations and other references should be included as part of each inspection module procedure to minimize searching through many documents to find vaguely remembered references.

- Manpower and time estimates should be included to allow inspection planning that maximizes the inspection coverage, given the time and manpower resources available. Such estimates will be for general guidance only and are not intended to limit the inspector's discretion as to the actual time necessary for any inspection.

- The inspection module procedure should contain enough technical and supplementary information, such as hints, tips, and "gotchas," to assist the inspector to make sound decisions. Obviously, we could write a book of technical and supplementary information for each module procedure, but in the real world, we must limit ourselves to information that is of immediate concern to the inspector.

The source material for the power reactor module is shown in Figure 8.

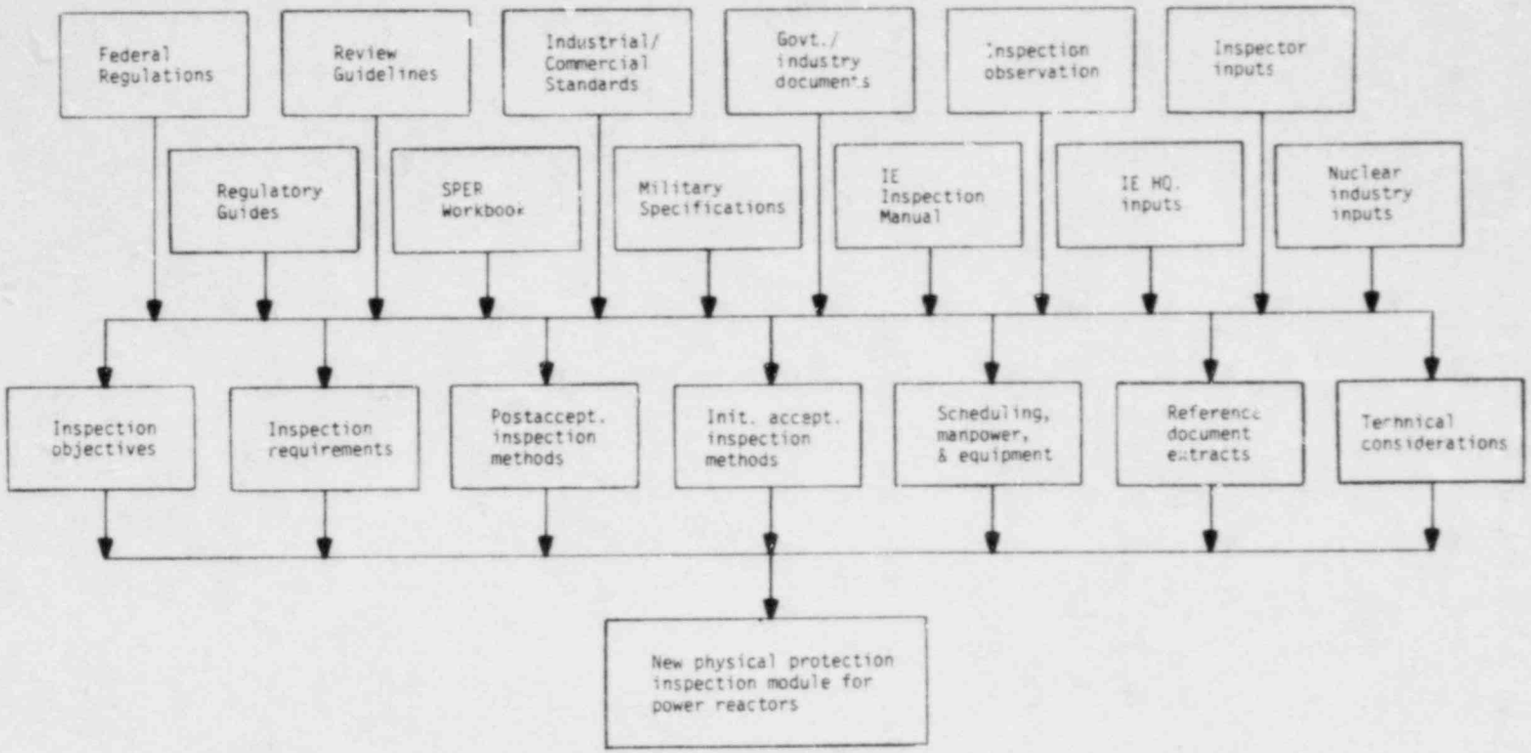

FIG. 8. Power reactor inspection module inputs

Module Format

The physical protection inspection module for power reactors contains the 23 procedures shown in Table 2. Each procedure contains seven sections as follows:

- Section 1.0 contains the inspection objectives and major subjects covered in the inspection module procedure.

- Section 2.0 contains the inspection requirements--the major tasks that the inspector must perform in exercising a specific inspection module procedure--and cites the regulations pertinent to each requirement.

- Section 3.0 contains guidance and methods for routine, postacceptance inspection of the physical protection system. While we recognize that the physical security plan is the governing document for determining licensee compliance, and that our guidance and methods may delve into areas not addressed in a given PSP, we provide guidance and methods broad enough to cover all systems that an inspector might reasonably be expected to encounter.

  We also recognize that some of the guidance and methods to be included in our module procedures will be more pertinent to adequacy assessment than to compliance evaluation. IE Headquarters has asked us to provide guidance and methods for adequacy assessment, so we have included such guidance and methods where appropriate. Our new postinspection procedure in each module will ultimately provide methodologies for combining the adequacy assessments from the various module procedures into an overall adequacy assessment of the facility.

- Section 4.0 contains guidance and methods for initial acceptance inspection of new physical protection systems or changes to existing systems. The rationale mentioned previously about Section 3.0

applies also to Section 4.0. This section applies mostly to equipment-oriented inspection procedures, and will usually contain more rigorous, full-coverage inspection guidance and methods.

During a routine, postacceptance inspection, normally Section 3.0 will be used. During inspection of changes to existing systems or inspection of systems for initial acceptance, Section 4.0 will be used. But if the situation warrants it, the inspector may choose to use the more rigorous inspection methods of Section 4.0 during a normal inspection.

- Section 5.0 provides our recommendations for inspection scheduling, the minimum number of inspectors needed, and the equipment necessary for each segment of the inspection activities included in the module procedure. We also include our best estimate of the maximum man-hours required for each segment of the inspection. We realize that the time required is site-dependent and that our estimates will provide only broad guidance. Also, we realize that several parts of an inspection module procedure, or even parts of several procedures may be exercised concurrently to reduce the time required. We do not intend to limit the inspector's discretion as to the actual time necessary for any inspection.

- Section 6.0 contains pertinent extracts from the Code of Federal Regulations, Security Plan Evaluation Report (SPER) Workbook, Upgrade Rule Guidance Compendium, Regulatory Guides, Review Guidelines, industrial/commercial standards, and military specifications. This section also defines terms used in the procedure.

  We include the pertinent extracts from Title 10 of the Code of Federal Regulations exactly as they were printed in the Federal Register. We also include those parts of 10 CFR that are cited in any of the other reference documents.

We include the pertinent sections of the SPER Workbook in our power reactor inspection module because they influenced most of the physical security plans now in use by power reactor sites. We realize that SPER Workbook requirements are not citable in matters of noncompliance unless those requirements are addressed in the PSP. However, the SPER Workbook requirements indicate staff interpretations used in the PSP approval process, and we have used them in our inspection methods and guidance.

We also include applicable parts of Regulatory Guides, Review Guidelines, and industrial/commercial standards. Again, these references are not used in citations of non-compliance unless specifically addressed in the PSP. However, they are useful as pointers toward practices that are acceptable to NRC and/or to industry, and provide a good basis for adequacy assessment.

We do not intend our definitions to be a glossary of buzz words. We will include only words and phrases that have limited and specific meanings in our module procedures.

- Section 7.0 contains technical considerations and supplementary information that we deem important to the module procedure being exercised. We include material in this section that will extend the inspector's technical knowledge and will, in many cases, provide the rationale behind our inspection guidance and methods.

TASKS 9, 10, and 11 TRANSPORTATION, RESEARCH REACTOR, AND FUEL CYCLE MODULES

These tasks will develop new IE physical protection inspection modules for non-power/research reactors, fuel cycle facilities, and transportation of nuclear materials. The IMPP team has been acquiring a data base for these modules, but no other work has been performed on these tasks during the period covered by this report.

TASK 12 GUARD T&Q PLAN MODULES

This task will provide a procedure in each of the four physical protection inspection modules that will include guidance and methods for evaluating the implementation of licensees' guard training and qualification (T&Q) plans.

As mentioned in the discussion of Task 8, we will defer writing the inspection procedure on guard T&Q plan implementation for the power reactor module and all other modules until the NRC Office of Nuclear Material Safety and Safeguards (NMSS) develops licensing review criteria to be applied to the licensee's submitted guard T&Q plans.

A training program for NRR license reviewers and IE evaluators of the licensee's submitted T&Q plans was delivered to NRC by the IMPP project under NRC FIN A0141-9. This program deals with a task analysis approach to the T&Q plans submitted. The training program is ready for use if the task analysis approach is accepted for the review criteria, and it could provide the basis for the inspection guidance and methods.

TASK 13 CONTINGENCY PLAN MODULES

This task will provide a procedure in each of the four physical protection inspection modules that will include guidance and methods for evaluating the implementation of licensees' contingency plans.

We have delivered to IE a rough prototype draft of an inspection procedure for evaluating contingency plans. This draft procedure is based upon existing fuel cycle/fixed site contingency plans previously approved by NMSS.

When we receive critique of the contingency plan inspection procedure draft and the contingency plan review criteria used by NMSS, we will write procedures for inspecting contingency plan implementation for the power reactor inspection module and all other modules.

TASK 14 INSPECTOR TRAINING

This task provides an inspector training program that will instruct the IE physical protection inspectors how to use the guidance and methods in the new inspection modules developed by the IMPP project.

We needed to obtain an understanding of the present IE inspector training programs, including both the training given to new physical protection inspectors and the on-going branch training provided at the Region offices. To obtain the information, the IMPP team visited the physical protection branch offices in Regions 1, 2, and 3 for discussions on current physical protection inspector training practices and needs. We found that the Region branch offices generally conduct inspector training by three methods: by sending individuals to courses and then having them lecture their home group; by using reading and writing assignments and reviewing the quality of the work; and by sending inspectors out on jobs with inspectors from other Regions.

Although a significant number of training courses are available at various locations, and while inspectors schedule participation in them, last-minute job demands frequently intervene. Consequently, the available training is much less used than regional personnel would like. Training of the exportable type (video tape, 35 mm slides, programmed work books, etc.) proposed by IMPP is clearly needed. There is a need for cross-fertilization training beyond the exchange of individual inspectors which could consist at least of periodic symposiums at the different regions.

The IE staff in the three Regions agreed that additional training is needed in at least the following areas:

- Equipment (alarms, sensors, sensitivity)
- Computer Based Systems (vulnerabilities, terminology)
- Compensatory measures (precedents, how-to-analyze)
- Sampling (random vs 100% inspection)
- Transportation (of general concern to Regional personnel)

Additional training needs were also suggested by one or more participants. These include subjects such as lighting and CCTV, psychological testing, communications, security during outages or construction, and issues such as security force turnover, fatigue, and vigilance (particularly for those working two jobs).

ADEQUACY ASSESSMENT

RES and IE have requested inclusion of guidance and methods in the IMPP inspection modules for assessing the adequacy of physical protection systems and equipment. The guidance and methods in every inspection procedure of each physical protection module provides adequacy criteria as well as compliance criteria. The postinspection procedure included in each module will have appended a methodology for combining the adequacy assessments from the inspections of the individual physical protection system elements into an overall assessment of the adequacy of the facilities physical protection systems.

The methodology used for this adequacy assessment is based on the approach presented in IE Temporary Instruction TI-1016. It uses a vulnerability chart to depict functional interrelationships between the physical protection subsystems and major elements that are viewed as obstacles to an adversary attempting to reach vital equipment within a vital area.

Associated with each element of the physical protection system is a list of potential vulnerabilities or failure modes that could be identified in the inspection process. Each vulnerability is represented by a parallel logic gate that could cause failure or degradation of that element of the physical protection system. After mapping noncompliances and deficiencies on the diagram, the inspector would trace through the diagram to see if an adversary could exploit the noncompliances and deficiencies to reach vital equipment. Potential adversary paths would be ranked in terms of their difficulty. The inspector would also rate the overall adequacy of the physical protection system as providing either high assurance, conditionally acceptable assurance, or unacceptable assurance against the specified threat, based on criteria provided in the methodology.

The adequacy assessment methodology has been expanded significantly from TI-1016 to reflect access control for personnel, vehicles, and packages; the insider threat; and compensatory measures for equipment failure.

COMPUTER EVALUATION HANDBOOK

At the management review meeting held at Bethesda, MD, in January 1980 between IMPP, IE, RES, NMSS, NRR, and SD, the IMPP management suggested that we produce a handbook that would provide the physical protection inspector with guidance and methods for evaluating computers as physical protection system elements. The proposed outline of this handbook is attached as Appendix C.

IE's response was a tentative approval provided that work on the computer evaluation handbook would not delay production of the inspection modules. Because the preparation and writing of the handbook would entail at least two man-months of effort and would seriously impact the production of inspection modules, the IMPP team will relegate production of a computer evaluation handbook to ongoing effort beyond the present contractual period.

MEETINGS

KICKOFF MEETING, JANUARY 1979

A kickoff meeting to initiate the IMPP project was held in Atlanta, GA, in January 1979 with representatives from IMPP, RES, IE, and Regions 1 through 4. At this meeting, we gained valuable insight into the problems and needs of the IE physical protection inspection process as viewed both by the inspectors and by IE headquarters staff.

RES/IE MEETINGS, FEBRUARY 1979

During a trip to the Washington, D.C., area in February 1979, the IMPP team met with representatives of RES at their headquarters in Silver Spring, MD, and with representatives of IE at their headquarters in Bethesda, MD.

At these meetings, we were given an overview of the development of physical protection inspection methods to that time and the views of both RES and IE headquarters on the technical documentation needs of the inspector.

RES/IE MEETING, MAY 1979

The IMPP management met with RES and IE representatives at IE headquarters in Bethesda, MD, in May 1979 to discuss our findings to date on IE's requirements for the types of information to be included in the deliverables from our original tasks.

We presented a proposed model for the deliverable of original Task 14 (see Appendix A) that would be based on the IE physical protection inspection module for power reactors. This was the seminal concept that later resulted in a redirection of the IMPP project and a revision of the original tasks and deliverables to the amended tasks and deliverables (see Figures 1 through 4) of the present IMPP project effort.

SEMINAR AND FORUM, JULY 1979

The redirection of the IMPP project required several management meetings between IMPP management, RES, and IE headquarters to define the necessary changes. A result of this effort was a seminar and forum held at Livermore, CA, in July 1979 to present the IMPP team's latest findings to RES representatives, IE headquarter's representatives, and our Region contacts, and to receive their suggestions and comments on the project.

The comments received during the forum resulted in the inspection module procedure format and content guidelines presented in the discussion of amended Task 8.

RES/IE MEETING, SEPTEMBER 1979

The IMPP management met with representatives from RES and IE headquarters in Torrey Pines, CA, in September 1979 to discuss progress, additional tasks proposed by RES and IE, and a schedule for deliverables.

The major results of this meeting were an amended Schedule 189 with an amended delivery schedule, and an agreement between IE and IMPP to field test drafts of the power reactor physical protection inspection modules.

RES/IE MEETING, JANUARY 1980

Representatives from RES, IE, NRR, NMSS, and SD met with IMPP management in Bethesda, MD, in January 1980 to hear an overview on IMPP project progress. We firmed the dates for IMPP project deliverables and for power reactor module field tests, as well as due dates for the Regions to return their comments on the draft power reactor module. We also discussed adequacy assessment criteria.

APPENDIX A

TASK DESCRIPTIONS FROM ORIGINAL SCHEDULE 189

19.0 SCOPE

The objective of this program is to provide NRC and new or present licensees with an improved and manageable technology baseline for physical protection. This will assist licensees in developing appropriate physical protection safeguards systems that comply with NRC regulations and IE in their field compliance evaluations. Methodologies must be developed to evaluate equipment/components and administrative and operational procedures used in the safeguarding of fixed sites. These methodologies will guide IE in their assessment evaluation program.

The NRC requires improved physical protection documentation on equipment/components and evaluation/inspection guides and techniques for evaluating all aspects of proposed and installed physical protection equipment. This is required to support the newly initiated general safeguards upgrade program. In addition, there is a need for a feasibility study addressing the developmental criteria, cataloging, and an evaluation guide for administrative and operational safeguard procedures. Preliminary criteria, procedures, and techniques will be identified in this feasibility study and future work will provide details for IE safeguard inspection and assessment to determine licensee compliance with NRC regulations.

Additional tasks include the development of an IE Inspector Training Program. An interim program will be a general introduction to physical protection equipment, its use, and general testing techniques. A final Inspector Training Program will have benefit of the effort expended developing the physical protection technology baseline discussed above.

This would allow for a program that is more germane to existing and future NRC approved sites. Such a program would be focused on the installation, operation, and testing of physical protection equipment, with emphasis on the newer, more complex systems coming into use.

These training programs would help carry the present high quality of IE work over into the upcoming generation of physical protection equipment, as well as increase IE inspectors' knowledge of present systems. LLL's experience in "packaging" courses dealing with such state-of-the-art fields as microprocessor system theory and microcomputer applications will result in a training program which can rapidly bring students to a fairly high level of technical sophistication.

TASKS/ACTIVITIES

The tasks and activities described, will be followed to satisfy the objectives of the NRC "Inspection Methods for Physical Protection" scope of work memo:

TASK 1.0 Obtain NRC field office and inspector input.

1.1 This task will assist us in determining the appropriate emphasis required to make the inspector more effective in his IE function.

1.2 Activities scheduled are:

1.2.1 Develop interface plan with NRC.

1.2.2 Contact IE Regional offices and inspectors.

1.2.3 Produce a report on findings.

TASK 2.0 Obtain Plant/Facility input.

2.1 This task will assist us in developing our program so that the documentation output can be most beneficial to the licensee for safeguard upgrade considerations.

2.2 Activities scheduled are:

2.2.1 Develop interface plan with NRC.

2.2.2 Conduct site visits.

2.2.3 Review NRC documentation on safeguards.

2.2.4 Produce a report on findings.

TASK 3.0 Review Mitre Equipment Catalog and Guide.

3.1 A technical review is required to ascertain appropriateness, usefulness, and current status of data presented.

3.2 Activities scheduled are:

3.2.1 Technically review existing data.

3.2.2 Verify data with vendors as to availability, upgraded specifications, replacement items, etc. (Mail/telephone activity.)

TASK 4.0 Conduct New Vendor Items Search.

4.1 This task is required to determine if new vendors exist that make equipment/components normally used in physical protection and what new equipment/components should be considered.

4.2 Activities scheduled are:

4.2.1 Review Thomas Register, EEM, security journals/periodicals for new vendors and items.

4.2.2 Contact known vendors for new item input.

4.2.3 Review input for appropriateness.

TASK 5.0 Review Government Efforts

5.1 Various government agencies have done data collection and evaluations in many areas of physical protection. The purpose of this task will be to survey as much of this work as possible.

5.2 Activities scheduled are:

5.2.1 Draw on NRC's knowledge of such activities in various branches of the government.

5.2.2 Conduct library/literature search on government efforts.

5.2.3 Review input for appropriateness.

TASK 6.0 Develop NRC Physical Protection Profile

6.1 This task is a data sort exercise.

6.1.1 Determine if there is a continuity of approach used by plants/facilities.

6.1.2 Determine defacto standardization of equipment/components.

6.1.3 Assess new physical protection devices to determine appropriateness for consideration.

6.1.4 Determine components/equipment, system configurations and therefore, inspection methods which appear feasible.

TASK 7.0 Upgrade Equipment Catalog.

7.1 Cull unnecessary and add new information as appropriate.

7.2 Edit/format material.

TASK 8.0 Upgrade Evaluation Guide

8.1 Cull unnecessary and add new information.

8.2 Edit/format material.

TASK 9.0 Upgrade Glossary/Index

9.1 Cull unnecessary and add new information.

9.2 Edit/format material.

TASK 10.0 Develop Testing and Verification Methods on a Generic Base

10.1 From the profile, establish criteria for testing and verification of components/equipment on a generic (class or function) basis.

TASK 11.0 Determine Equipment to be Tested

11.1 Develop list of equipment in plants/facilities.

11.2 Develop list of equipment to be tested.

11.3 Develop list with results of equipment tested in past.

TASK 12.0 Examine Specifications

12.1 Develop field test techniques and schedules.

12.2 Specify testing equipment.

12.3 Recommend test equipment/tool development.

12.4 Produce procurement specifications for test equipment and tools.

TASK 13.0 Study Safeguard Administrative and Operational Procedures

13.1 Conduct feasibility study to determine if further work will yield significant payoff.

13.2 Contingent on the results of the feasibility study, develop a catalog and evaluation guide.

TASK 14.0 Identify or Develop IE Safeguards Inspection and Evaluation Criteria, Procedures, and Techniques

14.1 Identify safeguards evaluation criteria and methodologies applicable to IE's evaluation program.

14.2 Identify techniques suitable for field compliance inspection.

14.3 Develop safeguards procedures and techniques to determine safeguard adequacy.

TASK 15.0 Develop an Interim Inspector Training Program

15.1 This Program will serve as a general introductory course to physical protection equipment and use. It will not have specific details about existing systems in NRC approved plants/facilities.

15.2 Activities scheduled are:

15.2.1 Develop course content.

15.2.2 Determine what the appropriate methods of presentation should be.

15.2.3 Develop the training program package.

TASK 16.0 Develop a Final Inspector Training Program

16.1 This Program would be focused on the installation, operation, and testing of physical protection equipment, with emphasis on the newer, more complex systems coming into use. Upon completion of the above tasks, an Inspector Training Program can be developed that would be most beneficial and meaningful to the inspectors.

16.2 Activities scheduled are:

16.2.1 Develop course content.

16.2.2 Determine what the appropriate methods of presentation should be.

16.2.3 Develop the training program package.

APPENDIX B
TASK DESCRIPTIONS FROM AMENDED SCHEDULE 189

19.0 SCOPE (NEW)

19.1 General

This is an amendment to the Inspection Methods for Physical Protection (IMPP) project Schedule 189, dated September 20, 1978. This amendment reflects changes in the scope of work, the tasks and the deliverables requested by IE after redefining their needs. The results of the work in the IMPP project to date will be fully applied in the redirected effort.

The data acquisition work of Tasks 1 through 6 is nearly complete, and the tasks will remain relatively unchanged. The deliverables from the old Tasks 7 through 12, as well as the tasks themselves, are deleted, and the effort expended in these tasks to date will be used in the new Tasks 8 through 14. Old Task 13 is renumbered as new Task 7, and remains as a deliverable. Old Task 16 is modified and renumbered as Task 14, and also remains as a deliverable.

The new tasks, as directed by RES/IE, are the development of a new series of expanded inspection modules to replace the existing 81000 Series procedures (81100 - Power Reactors, 81200 - Fuel Cycle Facilities, 81300 - Transportation, and 81400 - Research Reactors), and inspection modules for evaluating the implementation of contingency plans, and guard training and qualification plans.

19.2 Tasks

19.2.1 TASK 1.0: Obtain NRC field office and inspector input. (No Changes)

19.2.1.1 This task will assist us in determining the appropriate emphasis required to make the inspector more effective in his IE function.

19.2.1.2 Activities scheduled are:

19.2.1.2.1 Develop interface plan with NRC.

19.2.1.2.2 Contact IE regional offices and inspectors.

19.2.1.2.3 Produce a report on findings.

19.2.2 TASK 2.0: Obtain Plant/Facility input. (No Changes)

19.2.2.1 This task will assist us in developing our program so that the documentation output can be most beneficial to the licensee for safeguard upgrade considerations.

19.2.2.2 Activities scheduled are:

19.2.2.2.1 Develop interface plan with NRC.

19.2.2.2.2 Conduct site visits.

19.2.2.2.3 Review NRC documentation on safeguards.

19.2.2.2.4 Produce a report on findings.

19.2.3 TASK 3.0: Review Mitre Equipment Catalog and Guide. (Modified)

19.2.3.1 A technical review if required to ascertain appropriateness, usefulness, and current status of data presented.

19.2.3.2 Activities scheduled are:

19.2.3.2.1 Technically review existing data.

19.2.3.2.2 (Deleted)

19.2.4 TASK 4.0: Acquire Data on New Physical Protection Equipment. (Modified)

19.2.4.1 This task is required to acquire data about new equipment/components used in physical protection. New equipment will be identified from the survey of Task 6.

19.2.5 TASK 5.0: Review Government Efforts. (No Changes)

19.2.5.1 Various government agencies have done data collection and evaluations in many areas of physical protection. The purpose of this task will be to survey as much of this work as possible.

19.2.5.2 Activities scheduled are:

19.2.5.2.1 Draw on NRC's knowledge of such activities in various branches of the government.

19.2.5.2.2 Conduct library/literature search on government efforts.

19.2.5.2.3 Review input for appropriateness.

19.2.6 TASK 6.0: Develop NRC Physical Protection Profile. (Modified)

19.2.6.1 To gather data for this profile, a site-specific physical protection equipment survey of licensees will be made by LLL and by IE Inspectors.

19.2.6.2 Activities scheduled are:

19.2.6.2.1 Determine if there is a continuity of approach used by plants/facilities.

19.2.6.2.2 Determine defacto standardization of equipment/components.

19.2.6.2.3 Assess new physical protection devices.

19.2.6.2.4 Determine components/equipment, system configurations and therefore, inspection methods which appear feasible.

19.2.7 TASK 7.0: Study Safeguard Administrative and Operational Procedures. (Old Task 13, No Changes)

19.2.7.1 Conduct feasibility study to determine if further work will yield significant payoff.

19.2.7.2 Contingent on the results of the feasibility study, develop a catalog and evaluation guide.

19.2.8 TASK 8.: Develop Inspection Methods for Physical Protection of Power Reactors. (New)

19.2.8.1 Develop a set of new inspection modules for power reactors.

19.2.8.2 Activities scheduled are:

19.2.8.2.1 Field test module drafts.

19.2.8.2.2 Modify drafts to reflect changes necessary from field tests.

19.2.9 TASK 9.0: Develop Inspection Methods for Physical Protection of Transportation Activities. (New)

19.2.9.1 Develop a set of new inspection modules for transportation activities.

19.2.9.2 Activities scheduled are:

19.2.9.2.1 Field test module drafts.

19.2.9.2.2 Modify drafts to reflect changes necessary from field tests.

19.2.10 TASK 10.0: Develop Inspection Methods for Physical Protection of Research reactors. (New)

19.2.10.1 Develop a set of new inspection modules for research reactors.

19.2.10.2 Activities scheduled are:

19.2.10.2.1 Field test module drafts.

19.2.10.2.2 Modify drafts to reflect changes necessary from field tests.

19.2.11 TASK 11.0: Develop Inspection Methods for Physical Protection of Fuel Cycle Facilities. (New)

19.2.11.1 Develop a set of new inspection modules for fuel cycle facilities.

19.2.11.2 Activities scheduled are:

19.2.11.2.1 Field test module drafts.

19.2.11.2.2 Modify drafts to reflect changes necessary from field tests.

19.2.12 TASK 12.0: Develop Inspection Methods for Evaluating Guard Training and Qualification Plans. (New)

19.2.12.1 Develop a new inspection module for evaluating guard training and qualification plans.

19.2.12.2 Activities scheduled are:

19.2.12.2.1 Field test module draft.

19.2.12.2.2 Modify draft to reflect changes necessary from field tests.

19.2.13.1 Develop a new inspection module for evaluating contingency plans.

19.2.13.2 Activities scheduled are:

19.2.13.2.1 Field test module draft.

19.2.13.2.2 Modify draft to reflect changes necessary from field tests.

19.2.14 TASK 14.0: Develop Inspector Training Program. (Old Task 16.0, Modified)

19.2.14.1 Develop orientation program for field testing new modules.

19.2.14.2 Develop a multi-media training program for inspectors which will provide training in the use of all of the deliverables provided by the IMPP program.

19.2.14.3 Activities scheduled are:

19.2.14.3.1 Develop course content.

19.2.14.3.2 Determine what the appropriate methods of presentation should be.

19.2.14.3.3 Develop the training program package.

APPENDIX C
HOW TO EVALUATE COMPUTER SYSTEMS IN NUCLEAR FACILITY PHYSICAL PROTECTION

PROPOSED OUTLINE

1.0 INTRODUCTION

1.1 Elements of a Computerized Physical Protection System

1.1.1 Hardware

1.1.1.1 Intrusion Detection System and Interfaces

1.1.1.2 Access Control/Key Card System and Interfaces

1.1.1.3 Tamper Alarm/Line Supervision System and Interfaces

1.1.1.4 Mass Storage Systems

1.1.1.4.1 Disc
1.1.1.4.2 Diskette
1.1.1.4.3 Magnetic Tape

1.1.1.5 CRT/Teletype Terminals

1.1.1.6 Printers

1.1.2 Software

1.1.2.1 Intrusion Detection Software

1.1.2.2 Access Control/Key Card Software

3.1.2 Stringent Investigation of all Personnel having Access to Computer Software and Data Base

3.1.3 Two Independent Software Keys for Changing Software or Data Base

3.1.4 Back-up Mass Storage Copies of all Software and Data Base

3.2 Hardening of Computer Hardware

3.2.1 Locate Computer Hardware in Vital Area

3.2.2 Restrict Access to Computer Hardware Area

3.2.3 Wire Computer Area Intrusion Alarms Direct to CAS/SAS

3.2.4 Computer Hardware Tamper Alarms

3.2.4.1 Interface Tamper Alarm/Supervision Methods

3.2.4.2 Computer Mass Storage System Tamper Alarms

3.2.4.3 Wire Computer Hardware Tamper Alarms Direct to CAS/SAS

3.2.5 Uninterruptible Power Supply

4.0 COMPUTER SYSTEM PERFORMANCE

4.1 Data Content of Alarm Annunciations

4.1.1 CRT Terminals

4.1.2 Alarm Printouts

4.1.3 Lighted Annunciators

4.2 Multiple Alarm Handling

4.2.1 Alarm Annunciation Priority

4.2.2 Multiple Alarm Annunciation

4.3 Alarm/Access Records

4.3.1 Event Records

4.3.2 Event Record Data Content

4.4 Computer System Availability

4.4.1 Trouble/Maintenance Record

4.4.2 Mean Time to Repair Record

5.0 OTHER CONSIDERATIONS

5.1 After Computer Area Intrusion/Tamper Alarm

5.1.1 Test Intrusion Detection System Response

5.1.2 Test Access Control/Key Card Systems

5.1.3 Test Tamper Alarm/Line Supervision Systems

5.2 Contingency Plan for Computer System Failure

5.3 Contingency Plan for Computer System Errors

LLL:1980/5

NRC FORM 335 (7-77)

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

1. REPORT NUMBER *(Assigned by DDC)*
NUREG/CR-1258 Vol. 2
UCID-18123-79-4

4. TITLE AND SUBTITLE *(Add Volume No., if appropriate)*
INSPECTION METHODS FOR PHYSICAL PROTECTION PROJECT: ANNUAL REPORT, MARCH 1979 THROUGH FEBRUARY 1980

2. *(Leave blank)*

3. RECIPIENT'S ACCESSION NO.

7. AUTHOR(S)
R. T. Bradley, D. D. Bowden, A. W. Olson, F. Rogue, J. W. Savage, S. Scala

5. DATE REPORT COMPLETED
MONTH: March | YEAR: 1980

9. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS *(Include Zip Code)*
Lawrence Livermore National Laboratory
NSS Safeguards Program/Physical Protection Project
T-1202, Room 211, L-97
P. O. Box 808
Livermore, CA 94550

DATE REPORT ISSUED
MONTH: June | YEAR: 1980

6. *(Leave blank)*

8. *(Leave blank)*

12. SPONSORING ORGANIZATION NAME AND MAILING ADDRESS *(Include Zip Code)*
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

10. PROJECT/TASK/WORK UNIT NO.

11. CONTRACT NO.
FIN No. A0143

13. TYPE OF REPORT
NUREG

PERIOD COVERED *(Inclusive dates)*

15. SUPPLEMENTARY NOTES

14. *(Leave blank)*

16. ABSTRACT *(200 words or less)*

This is the annual report to the U.S. Nuclear Regulatory Commission (NRC) of progress at Lawrence Livermore National Laboratory (LLL) during the first year of the Inspection Methods for Physical Protection project. This report details the activities of the first year of work that culminated in delivery of field-test drafts of new procedures for inspecting the physical protection systems at nuclear power reactor sites.

17. KEY WORDS AND DOCUMENT ANALYSIS

17a. DESCRIPTORS

17b. IDENTIFIERS/OPEN-ENDED TERMS

18. AVAILABILITY STATEMENT
Unlimited

19. SECURITY CLASS *(This report)*
unclassified

21. NO. OF PAGES
62

20. SECURITY CLASS *(This page)*
unclassified

22. PRICE
$

120555008386 2 ANRS
US NRC
SECY PUBLIC DOCUMENT ROOM
BRANCH CHIEF
WASHINGTON DC 20555