
Inspection Methods for Physical Protection Project: Quarterly Report, September–November, 1979

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Lawrence Livermore Laboratory

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FOREWORD

At the request of the Office of Nuclear Regulatory Research of the U.S. Nuclear Regulatory Commission (NRC), the Lawrence Livermore 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.

This is the third quarterly report on work in the IMPP project, but the first quarterly to be printed as a NUREG. The first two quarterlies (March-May, 1979, and June-August, 1979) were issued as Lawrence Livermore Laboratory documents under the numbers UCID-18123-79-1 and UCID-18123-79-2.

The work of the IMPP project is supported by the NRC under interagency agreement DOE 40-550-75 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.

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ABSTRACT

This is the third quarterly report to the U.S. Nuclear Regulatory Commission (NRC) of progress at Lawrence Livermore Laboratory in the Inspection Methods for Physical Protection project. Besides presenting the activities and findings of the project's third quarter, this report details additional changes in the tasks and deliverables as requested by the NRC offices of Nuclear Regulatory Research (RES) and Inspection and Enforcement (IE).

SUMMARY

The Nuclear Regulatory Commission offices of Inspection and Enforcement (IE) and Nuclear Regulatory Research (RES) have assigned new tasks and deliverables to the Inspection Methods for Physical Protection (IMPP) project. These new tasks and deliverables are the development and production of new physical protection inspection procedures (modules) for research reactors, fuel cycle facilities, and transportation. We have also been asked to develop and produce inspection modules for evaluating the implementation of contingency plans and of guard training and qualification plans.

We have delivered three of the power reactor inspection modules to RES, IE headquarters, and Region offices for review and comment. These initial modules will be field tested in December 1979. Ten or more of the 23 modules in this series are at least in the first typed draft state at this time.

Members of the IMPP project team have observed physical protection inspections at the following sites this quarter:

- Millstone Nuclear Station, Region I
- Apollo Facility, Region I
- North Anna Station, Region II
- St. Lucie Station, Region II
- Humboldt Bay Station, Region V

Team members also visited the NRC offices in Regions I, II, and III for consultations.

We have delivered a draft of our report, The Feasibility of Field Evaluation of Physical Protection Procedures, to RES and IE for review and comment. When RES

and IE approve the methodologies proposed for evaluating procedures that are described in this report, we will expand our work on these methodologies.

The Site-Specific Physical Protection Equipment Survey produced completed questionnaires from 9 of the 48 power reactor sites and 20 of the 59 research reactor sites. This is insufficient data for the Physical Protection Profiles. At the request of RES and IE, we developed an abbreviated survey form for IE physical protection inspectors to use in gathering the necessary data during their normal on-site inspections.

INTRODUCTION

The Inspection Methods for Physical Protection (IMPP) project work expanded in the third quarter, September through November 1979, to include the development and production of physical protection inspection procedures (modules) for all of the facilities and activities licensed by the U.S. Nuclear Regulatory Commission (NRC). The NRC offices of Inspection and Enforcement (IE) and Nuclear Regulatory Research (RES) added this work to the IMPP project tasks previously assigned and currently underway.

MANAGEMENT MEETING

The IMPP project managers met with J. Durst and E. Richard of RES, and with D. Chapell and L. Bush of IE Headquarters at Torrey Pines, California, on September 26-28, 1979. We discussed progress to date, additional tasks proposed for the IMPP project by RES and IE, and a schedule for deliverables.

NEW TASKS AND DELIVERABLES

The new tasks and deliverables assigned to the IMPP project at this meeting were the following:

New Inspection Modules

- Fuel Cycle Facilities (81200 series replacements)
- Transportation (81300 series replacements)
- Research Reactors (81400 series replacements)
- Guard Training and Qualification Plan

Field Tests of Module Drafts

All IMPP developed modules will be field tested in draft form by IE Regional inspectors, and will be modified as necessary before final acceptance by IE. The IMPP team will participate in some of these field tests, as selected by IE.

Inspector Training

The previous inspector training will expand to provide orientation to the inspectors who perform the field tests on our new modules, and to include training on the use of the added IMPP modules.

AMENDED DELIVERY SCHEDULE

RES, IE, and the IMPP team agreed to a tentative new delivery schedule for the deliverables due from the tasks of the IMPP project. This tentative schedule is shown in Fig. 1.

AMENDED SCHEDULE 189

The amended Schedule 189 mentioned in the previous IMPP quarterly report of June-August 1979, has been changed to reflect the new tasks, deliverables, and delivery schedules. This latest amended Schedule 189 has been submitted to RES for approval.

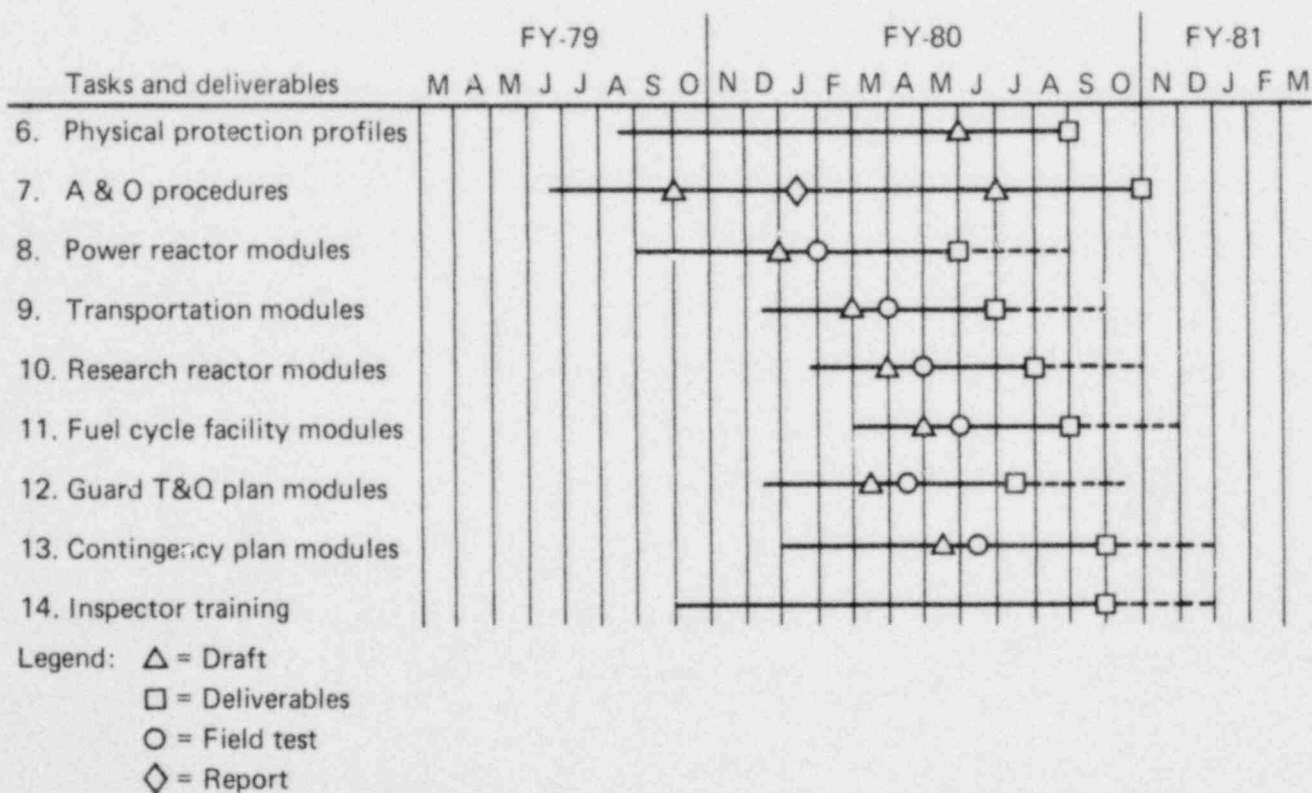


FIG. 1. Amended delivery schedule.

THIRD QUARTER EFFORT

MODULE STATUS

We devoted a large part of our third quarter effort to producing drafts of several new inspection modules for physical protection of power reactors. Components of this effort included designing the module format, devising a system for assigning procedure numbers to each module, researching for module content, observing IE physical protection inspections at power reactor sites, and writing drafts of the modules. Table 1 shows the module status at the end of the third quarter.

Procedure Numbers

At the suggestion of O. Chambers of IE, we assigned procedure numbers to the power reactor inspection modules as shown in Table 1. The letter X in the third digit position indicates the field test draft series, and will appear as X, Y, or Z as necessary. This letter will change in the final draft to a number assigned by IE. The last two digits were chosen to prevent duplication of the existing numbers of the 81100 series procedures, while allowing for future procedure numbers to be inserted into this new number series. A similar numbering system will be assigned to the modules for research reactors, fuel cycle facilities, and transportation activities.

Field Test Drafts

We delivered field test drafts of three inspection modules for power reactor physical protection to IE Headquarters and to IE Region offices for review and comment and for field testing. The modules delivered were:

- 81X34 Security Program Audit
- 81X38 Records and Reports
- 81X62 Lighting

TABLE 1. Power reactor inspection module status report.

Module	Status												
81100 series replacements	Research	First draft	LLL tech, review	Editing draft	Field test draft	IE review	Field test	Post F.T, draft	LLL tech, review	Final editing draft	Final draft	IE review	Final approval
81X10 Preinspection	█	█											
81X14 Orientation	█	█											
81X18 Security plan and implementing procedures	█												
81X22 Contingency plan	█	█											
81X26 Guard training and qualification plan	█	█											
81X30 Security organization	█												
81X34 Security program audit	█												
81X38 Records and reports	█												
81X42 Testing and maintenance	█	█											
81X46 Locks, keys, and combinations	█	█											
81X52 Physical barriers — protected area	█												
81X54 Physical barriers — vital area	█												
81X58 Security system power supply	█												
81X62 Lighting	█												
81X66 Assessment aids	█												
81X70 Access control — personnel	█												
81X72 Access control — packages	█												
81X74 Access control — vehicles	█												
81X78 Detection aids — protected area	█												
81X80 Detection aids — vital area	█												
81X84 Alarm stations	█												
81X88 Communications	█												
81X90 Postinspection	█												

The only field test attempted in this quarter was at the Humboldt Bay Station of the Pacific Gas and Electric Company near Eureka, California.

Unfortunately, this power reactor is out of service and its physical protection systems have not been updated to meet the requirements of 10 CFR 73.55. The field test results were inconclusive because the old physical security plan in effect allowed few of the new inspection methods in our modules to be properly exercised.

We have not yet received feedback from IE and the Regions on these three modules.

INSPECTION OBSERVATION TRIPS

During the third quarter, the IMPP team observed physical protection (PP) inspections at four power reactors and one fuel cycle facility. We intended to visit at least one research reactor facility, but scheduling problems intervened.

Millstone Nuclear Station, Region I

F. Rogue and J. Hodges of the IMPP team observed the PP inspection of the Millstone Station, Northeast Utilities, near Waterford, Connecticut, September 24-28, 1979. NRC Region I Inspectors E. Jones and R. Bailey performed the inspection.

Apollo Facility, Region I

F. Rogue of the IMPP team observed the PP inspection of the Babcock and Wilcox Company facility near Apollo, Pennsylvania, November 27-30, 1979. NRC Region I Inspector R. Bailey conducted this inspection.

This is the first fuel cycle facility inspection that the IMPP team has observed.

North Anna Station, Region II

S. Scala and J. Ketchel of the IMPP team observed the PP inspection of the North Anna Station, Virginia Electric and Power Company, near Fredricksburg, Virginia, October 23-26, 1979. This inspection was conducted by NRC Region II Inspectors J. Howell and A. Tillman.

St. Lucie Station, Region II

R. Bradley and D. Richardson of the IMPP team observed the PP inspection of the St. Lucie Station, Florida Power and Light Company, near Ft. Pierce, Florida, October 22-25, 1979. Inspector D. Moore of Region II conducted the inspection.

Humboldt Bay Station, Region V

S. Scala and D. Richardson of the IMPP team joined the inspection at the Humboldt Bay Station, Pacific Gas and Electric Co., near Eureka, California, November 19-21, 1979, to observe the inspection and to participate in the field test as mentioned previously in this report. NRC Region V Inspector W. Mortensen conducted the inspection and the field test of the new modules.

Trip Report Classification Problem

The reports of our inspection observation and field test trips contain sensitive and proprietary information that has delayed their distribution. Although the IMPP project is supported by the NRC through an interagency agreement with the U.S. Department of Energy (DOE), LLL must satisfy DOE guidelines on the distribution of sensitive national information. Until we receive guidance on the proper classification and distribution of these trip reports from the LLL classification office, we must withhold their distribution.

OTHER TRIPS

IMPP team members also traveled during the third quarter to gather information for our tasks of developing PP procedures evaluation and inspection training.

Inspector Training Trips

J. Ketchel of the IMPP team visited NRC offices in Regions I, II, and III for discussions on current PP inspector training practices and needs.

Participants from the Regions were:

- Region I: W. Martin, G. Snyder, and J. Devlin
- Region II: W. Tobin, C. Perney, K. Besecker
- Region III: J. Donahue

We found that the Regions generally conduct training by three methods: by sending individuals to courses and then having them lecture their home group; by using readings and written 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 inspectors do 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 proposed by IMPP is clearly needed. There is a need for cross-fertilization training beyond the exchange of individual inspectors. If time and budget permit, we suggest periodic symposiums at the different Regions.

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

- Equipment (alarms, sensors, sensitivity).
- Computer Based Systems (vulnerabilities, terminology, card readers).
- Compensatory measures (precedents, how-to-analyze).
- Sampling (heavy turnover of guards, 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 fatigue and vigilance (particularly for those working two jobs).

PP Procedures Trips

J. Savage traveled to the NRC Region III office in Glen Ellyn, Illinois, September 24-26, 1979, to converse with J. Donahue on physical protection procedure evaluation and to study the Region III file of licensees' procedures.

PHYSICAL PROTECTION PROCEDURES STUDY

One of our original subtasks was to study methods of evaluating the administrative and operational (A&O) procedures used in physical protection to determine whether further work would yield a significant payoff.

We have completed this subtask and have 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.

RES and IE will determine from their review of the methodologies proposed in the draft report whether further work in procedures evaluation is worthwhile.

PHYSICAL PROTECTION EQUIPMENT SURVEY

The returns of the site-specific physical protection equipment survey were disappointing. A recap of these returns is given in Table 2.

The low quantity of returns makes an insufficient data base for developing the Physical Protection Profiles. The data obtained will provide insight into the equipment actually being used by the licensees, but this data is useful at present only for limited guidance in developing the inspection modules for power reactors.

TABLE 2. Physical protection equipment survey recap.

Regions	Power Reactors		Research Reactors	
	Sites	Returns	Sites	Returns
I	17	2	16	6
II	11	3	8	3
III	13	2	11	3
IV	4	2	11	5
V	<u>3</u>	<u>0</u>	<u>13</u>	<u>3</u>
Totals	48	9	59	20

At the request of RES and IE, the IMPP team has developed and submitted a draft of a short form physical protection equipment survey questionnaire designed for inspectors to use during normal inspections. RES and IE should decide whether to pursue this survey further, and if the decision is negative they should delete the Physical Protection Profiles task as a deliverable.

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