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LETTER REPORT

NRC Research and Technical Assistance Report

NRC Research and Technical Assistance Report

NRC SAFEGUARDS MATERIAL CONTROL AND ACCOUNTING PROJECT

MONTHLY LETTER REPORT FOR OCTOBER 1980

A. J. POGGIO
PROGRAM LEADER

NRC Research and Technical Assistance Report

NRC Research and Technical Assistance Report

TASK 1. ASSESSMENT METHODOLOGY APPLICATIONS AND DEVELOPMENTS

Contributors: W. J. Orvis, C. J. Patenaude, A. J. Poggio, and P. S. Wahler

TECHNICAL ACTIVITIES

We continued our Task 1 activities in upgrading the Structured Assessment Approach (SAA) and in documenting the SAA Input Package.

Upgrade of the Structured Assessment Approach

We have been working on two SAA preprocessor programs. One program evaluated the Safeguards data in the Tektronix 4054 Minicomputer for errors and consistency; the other prepares the data from the Tektronix 4054 for the programs in the CDC 7600 computer.

We made significant changes to the first preprocessor program during October. We improved this code to enter as data whether a monitor detects only the presence of unauthorized personnel, or whether it detects also anomalous behavior of authorized personnel in its field of view. Making this upgrade required us to rewrite some of the input codes and several parts of both the Structured Assessment Approach (SAA) Input Package, Vol. 3: User's Manual (Physical Security) and the Structured Assessment Approach (SAA) Input Package, Vol. 1: Data-Gathering Handbook (Physical Security).

We have also made it possible to model access to a specific door through access to the key by adding locks to the list of monitors and adding keys as utilites to those locks.

We have also begun code development on the second preprocessor program. This program edits the error-corrected data generated by the Tektronix preprocessor program according to a set of input parameters, which define a specific adversary's goals and attributes. The data file is then put in a form acceptable to the SAA physical protection package on the CDC 7600.

The input parameters needed to define an adversary's goals and attributes include the minimum volume of SNM per theft attempt to define the attractive targets, the barrier resistance the adversary is capable of penetrating (both for location transversal and for equipment tampering), the hazard level the adversary is willing to risk, and the tamper sophistication level of the adversary. This information is added to the text file which provides the general description of the facility in each report generated by SAA.

This preprocessor program changes the input data to fit these defined parameters, condenses the area adjacency information to delete equivalent areas, generates the extended access list, and converts the raw performance data on the operating equipment into the probability of the equipment operating at any time.

Future Plans. To make the codes operate more smoothly, we are going to make the codes automatically adjust to fit the size of the data being used. As part of this process, a code will also be written to select subsets of the output from the Coverage, Weak Collusion, and Adequacy Assurance and Sensitivity levels of the SAA to use as input to the Tampering level. This final development phase of the SAA will link all portions of the SAA package and allow for a smooth transition through the entire set of computer runs.

Structured Assessment Approach Documentation

The final production work continued on the Structured Assessment Approach (SAA) Input Package Vols. 1, 2, and 3.

TASKS 2 AND 3. DEVELOPMENT OF VALUE-IMPACT METHODOLOGY

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TECHNICAL ACTIVITIES

Documentation continued on the final contract deliverable, the Value-Impact Results of the Upgrade Rule. The excellent results prove the usefulness of the Aggregated Systems Model.

Documentation also continued on A Formal Systems Model for Nuclear Safeguards: A Tool for Evaluating the Overall Benefits of Improved Safeguards Performance. This report is a description of a sophisticated model to evaluate the benefits to society of different improvements in safeguards performance.

Drafts of both reports will reach NRC Headquarters in November.

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