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Author(s): John H. O'Brien

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Robert L. Shepard, Technical Support Branch, SAFER:RES

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Prepared By
Lawrence Livermore Laboratory
P.O. Box 808
Livermore, California 94550

Prepared for
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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March 13, 1979
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NRC Research and Technical
Assistance Report

Dr. Robert L. Shepard
Technical Support Branch
Division of Safeguards, Fuel Cycle
and Environmental Research
Office of Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Bob:

This letter constitutes the monthly letter report for January, 1979,
for the LLL Material Control Program.

The activities are organized relative to the major areas of development
as listed in our Program Milestone Chart.

Assessment Methodology Development

(LLL Contributors: P. Alesso, M. Dittmore, F. Gilman, R. Harvey,
J. Huebel, J. Lim, A. Parziale, C. Patenaude, P. Renard, and I. Sacks)

Documentation of the assessment of Facility 'X' was completed, and a
two-volume report will be sent to the NRC.

Work is continuing on the extension of various graph condensation
methods to Petri nets.

A preliminary report on the Level IV analysis code, CLAMOR, has been
completed.

Summaries of the following papers were written for preliminary review
for the INMM Conference in July:

1. A Structural Approach to Safeguards Assessment, by A. Parziale.
2. Safeguards Design with Petri Nets, by A. Parziale.

Summaries of the following papers were submitted for the American
Nuclear Society 1979 Annual Meeting in June:

1. A Methodology for Aiding Nuclear Safeguards Decision-Making, by
S. Weissenberger and B. R. Judd (Applied Decision Analysis,
Inc.).

2. Generation of Fault Trees for Non-Coherent Systems, by M. H. Dittmore and F. M. Gilman.

Facility and Component Characterization

(LLL Contributors: J. Candy, D. Dunn, D. Freeman, J. Huebel, and R. Rozsa)

Final documentation of the monitor characterization work for Facility 'X' assessment is near completion.

Work is continuing on the estimator application to the actual concentrator output data from Systems Control, Incorporated, (SCI). Due to model mismatching problems, (simple vs. complex), numerous "tuning" runs must be made. Design of the simple diversion detectors was completed, and will be applied to the SCI run data.

A UCRL report describing the simple model of the plutonium nitrate concentrator is being written to compare the simple model, the detailed SCI model, and a closed form solution.

A summary of the following paper was submitted for the American Nuclear Society 1979 Annual Meeting in June:

1. On-Line Diversion Detection Safeguard Concepts, by J. Candy and D. Dunn.

Testing of Assessment Methodology - Facility 'X' Assessment

(LLL Contributors: J. Candy, M. Dittmore, D. Dunn, F. Gilman, J. Huebel, J. Lim, and R. Sanborn)

A LCM version of FTAP was made to compile under the FTN compiler and run successfully. The output from FTAP on the Facility 'X' accounting system will be compared with that from SETS before more runs are made.

System Effectiveness Measures

-(LLL Contributors: R. Al-Ayat, G. Corynen, M. Dittmore, R. Thatcher)

Some of the work done on the structuring of safeguards system performance measures has been collected into a major report. This work establishes a formal foundation for structuring complex systems. It is expected to lead to a hierarchic safeguard system model which will improve our understanding of how the safeguard subsystems fit together as models or as management tasks, and how modeling and computation activities at the detailed subsystem level can be aggregated into overall system performance statements.

An associated memorandum on existing and proposed safeguard performance measures will be published next month. This paper formally describes various measures now in use against the backdrop of our framework developed in the above report.

A draft of an outline for a generic value/impact analysis for regulations upgrade is almost complete.

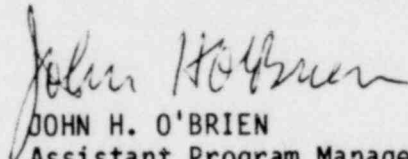
Some useful major reports are being derived as this activity is phased out.

Applications and Development Facility (ADF)

(LLL Contributors: J. Huebel, D. Ross, and R. Sherwood)

The first draft of a written report (essentially a written version of the briefing presented to Jay Durst last month), discussing the implementation study for the ADF was completed.

Sincerely,



JOHN H. O'BRIEN
Assistant Program Manager
NRC Safeguards Program

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copy to:

R. Dube, NRC

E. McAlpine, NRC

B. Mendelsohn, NRC

All Material Control Personnel