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UNITED STATES

NUCLEAR REGULATORY COMMISSION

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SECY-78-370

INFORMATION REPORT

For: The Commissioners

From: Clifford V. Smith, Jr., Director
Office of Nuclear Material Safety and Safeguards

James R. Shea, Director
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Thru: *for* Executive Director for Operations *C. J. Smith*

Subject: IAEA SAFEGUARDS IMPLEMENTATION REPORT (SIR) COVERING 1977

Purpose: To provide the Commission an analysis of Part I of the subject report that was issued on May 16, 1978.

Discussion: The second annual safeguards implementation report of the IAEA will be issued this year in two parts. Part I contains an introduction, the main conclusions and recommendations. Part II which is still under preparation will contain supporting statistical and technical information. Part I was issued on May 16, 1978, for review of the Board of Governors at its June meeting. A copy of this document was recently forwarded to the Commission (SECY-78-286).

A detailed technical analysis of Part I is attached. A separate analysis of the SIR by the U.S. Mission to the IAEA was forwarded to the Commission in a memorandum dated June 8. The two reports complement each other. The latter partially decodes Part I and provides confirmation of the decoding of the SSIR covering 1976 that was performed by NMSS and transmitted by memorandum to the Commission on April 13, 1978. It should be noted

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U.S. NRC Declassification Review

1. REVIEW - DATE: <u>2026070</u>	DETERMINATION (CIRCLE NUMBER(S))
2. REVIEWER: <u>3470</u>	1. CLASSIFICATION RETAINED
3. AUTHORITY: <u>DDC</u> <u>DD</u>	2. CLASSIFICATION CHANGED TO:
4. REVIEW - DATE: <u>20250609</u>	3. CONTAINS NRC CLASSIFIED INFO
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that the decoding provided by the U.S. Mission identifies the countries under IAEA safeguards by group, but does not identify the countries which have significant implementation problems. The major change in the 1977 SIR is the addition of the four non-weapon states in the European Community which contain a large number of nuclear facilities (Belgium, Federal Republic of Germany, Netherlands and Italy).

The SIR concludes that no diversion of nuclear material occurred in any of the 40 States where safeguards agreements were in full implementation. In some instances these judgments were based partly upon qualitative considerations. The general level of safeguards implementation achieved in 1977 appears to be comparable to that reported a year earlier for 1976. A significant growth in the number of facilities subject to IAEA inspection offset a major increase in inspection effort. Many of the basic safeguards problems reported in the SIR, including incomplete verification, are a repeat of those identified in the prior SSIR. The Agency did introduce a number of initiatives to improve safeguards, but their implementation was not sufficiently advanced to impact on overall performance for 1977.

Part I of the 1977 SIR is less specific and forthcoming than the comparable section in the 1976 SSIR. If this approach is continued in Part II, the report will be of only limited usefulness.

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Technical Review of Part I of the SIR Covering CY 1977

(GOV/1897, May 16, 1978)

Part I includes the main conclusions and recommendations of the SIR. Part II, which contains the supporting statistical and technical information, will be issued at a later date. Because of this limitation, the following review is basically a comparative analysis of the information presented in the SIR and the previous IAEA report (SSIR) issued a year ago for 1976.

Major Conclusion of the SIR

The main conclusion of the report is that no diversion occurred in any of the 40 states where regular inspections were carried out in 1977. For 34 States it was reported that the IAEA verification activities were considered adequate to quantitatively confirm the presence of the safeguarded nuclear material. For the other six States, including the majority of those which contained bulk handling facilities, the conclusion of no diversion was based at least partially on qualitative considerations. On the surface this appears to be a slight improvement in quantification over 1976 when complete quantification was not achieved in 10 States or any of those containing bulk handling facilities.

Inspections were also carried out in the non-weapon States of EURATOM which had nuclear activities. Four of these States have a large number of nuclear facilities, including a sizeable number of bulk handling plants. Before February 1977, the EURATOM inspectorate had complete responsibility for safeguards within the European Community. During 1977, the inspection activities of the IAEA were focused on verifying design information and initial inventories. Continuous inspection was initiated at the WAK reprocessing plant in the Federal Republic of Germany. Partially as a result of these transition activities, complete verification of inventories was not achieved. Considerable work will be required in 1978 to complete facility attachments and verification of inventories.

Independent assessment of the adequacy of IAEA verification during 1977 cannot be performed on the basis of the information provided in Part I. Adequacy criteria are not provided and no guidance is provided as to what is meant by the phrase, "confirmed to the satisfaction of the Secretariat." For example, Table 6 indicates that IAEA verification was adequate in two States which contained bulk handling facilities. On page 18, the statement is made with reference to all States containing bulk handling facilities that verification "had not yet reached the high verification standards set as a target". No confirmation is provided in either the SIR or the SSIR that all the States which are subject to inspection were actually inspected during the year.

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IAEA Inspection and Verification

The IAEA Department of Safeguards was reorganized early in 1977 to strengthen management controls and to accommodate a rapidly growing staff. Inspection operations were divided into two divisions to provide additional supervisory support to those activities. In view of the importance of the evaluation function for assessing the effectiveness of safeguards, a Safeguards Evaluation Section was established in June 1977 directly under the Deputy Director General for Safeguards. However, only skeleton staffing was provided for the rest of the year. The U.S. Offer, in which the NRC is a party, to provide direct support to this Section is a unique opportunity to provide direct input and to facilitate the development of an effective evaluation program within the IAEA.

During 1977, the effort to establish performance criteria in terms of significant quantities and detection timeliness was continued. Provisional values have been adopted as targets for IAEA verification. Representatives from some member states in attendance at the States' Systems of Accounting and Control of Nuclear Materials Advisory Group Meeting in April 1978 voiced serious concern over these provisional values. It is clear that considerable effort is still required to establish acceptable criteria for verification. Completion of this task is believed essential for improving inspection performance and assessment capabilities.

The SIR reflects a continuing awareness on the part of the IAEA that there is a great need to improve inspection coverage and verification performance. This is especially true for bulk handling facilities processing plutonium and high enriched uranium. Deficiencies in verification of material flows and inventory quantities are serious for certain types of operations. Improvement in States' systems of accounting and control would be a great help to IAEA verification. Additional measurement capabilities are required for inspector utilization. The frequency of checking inventories must be improved in many facilities to achieve goals for detection timeliness. The rapidly growing workload of the IAEA is taxing the resources of that Agency to maintain present levels of performance. The large technical assistance program of the U.S. and assistance from other States appear necessary to supplement the resources of the IAEA, especially in the area of program development.

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States' Systems of Accounting for and Control of Nuclear Material (SSAC)

Serious problems continue to persist with respect to the establishment of adequate state systems for material accounting and control. The SIR provides the following insight into the extent of the problem in 1977:

- o 23 States did not make arrangements for timely and accurate reporting of information to the Agency
- o 14 States did not have an adequate system of facility records
- o 13 States did not have adequate procedures for taking physical inventories.

Only one of the States which contain bulk handling facilities is reported to have a well developed SSAC program. The slow rate of improvement is understandable to a degree for the 18 States which had non-NPT types of safeguards agreements that did not specifically require SSACs. Of the other 27 States, only 7 had well developed SSAC programs. This is a serious problem because the establishment of effective SSAC systems is essential to the full implementation of international safeguards. The SIR states that there was useful progress during 1977 in a number of cases. It is clear that a major effort is still needed to improve most SSAC programs.

The failure of the SIR to directly mention the capability or performance of states to close material balances is noteworthy because material accountancy is the measure of fundamental importance to international safeguards. The SSIR report covering 1976 reported that most of the States which contained bulk handling facilities used by-difference accounting procedures which made it difficult or impossible to draw valid conclusions from material accountancy regarding the possibility of diversion. The SIR only indirectly indicates the existence of material measurement and physical inventory problems. The failure of the SIR to directly address material balance accounting performance in its main conclusions must be viewed as a serious deficiency of the report.

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Non-Safeguarded Activities

The number of States reported to have non-safeguarded nuclear facilities remained unchanged at 5 for 1977. None appears to be party to the NPT. Correction will probably have to come through pressures applied outside of the IAEA.

IAEA Initiatives

The SIR indicates that significant progress was achieved in certain areas and at least some progress was made in many others where problems were identified in the 1976 SSIR. Perhaps the most noteworthy of these is the introduction of continuous inspection at the WAK (Federal Republic of Germany) and the Tokai-Mura (Japan) reprocessing plants. The SIR indicates that the IAEA intends to establish continuous inspection at facilities with high capacity and throughput of nuclear material. This would be a significant milestone in IAEA safeguards. A large development effort will probably be required to fully implement this program.

One of the recommendations in the 1976 SSIR was that communications should be addressed to the appropriate States conveying recommendations for improvement to State systems of accounting and control. The SIR reports that 16 States were informed of SSAC deficiencies, and supposedly recommendations were made for improvement. This too is an important step toward improving safeguards implementation, although it is not completely clear why the number of States was so low. The recommendations in the SIR do not address this subject. It is important that States be regularly notified of any safeguards deficiencies and that the IAEA follow up on these notices to see that corrective action is initiated and completed. Continuation and expansion of this effort should be undertaken by the IAEA in 1978.

The IAEA has actively pursued a number of other initiatives to upgrade SSAC implementation. In some instances the IAEA has been successful in getting States to apply safeguards measures which are not specifically included in non-NPT safeguards agreements and some old NPT agreements. This is especially true with respect to containment and surveillance measures. Nonetheless, there are still some States, for example, where physical inventory-taking is not a normal practice. Although this slow piecemeal approach has resulted in some improvements and should be continued, as appropriate, it seems that the ultimate solution requires

renegotiations of old safeguards agreements to upgrade them to present standards. In this respect a new model for subsidiary arrangements has been developed to harmonize accountancy methods. A golden opportunity for upgrading old systems is the present activity of changing the non-NPT agreement with Japan to an NPT type of agreement. One of the main recommendations in the SIR should be to renegotiate old IAEA agreements.

The IAEA held an Advisory Group Meeting in April 1978 to finalize SSAC guidelines for inclusion in an INFCIRC document on that subject. As a result of that meeting extensive rework of the draft document is in progress. Another meeting will be convened in a few months. Completion of this project would be a significant aid to improving SSAC implementation.

Conclusion

Part I in the SIR is written in terms of more generalizations and covers less subject matter than its comparable sections in the 1976 SSIR. Very little new performance information is presented. An extension of this approach to Part II could seriously compromise the purpose of the report, i.e., to satisfy the needs of Member States and the Board of Governors for reliable progress reports and assurance of system effectiveness.

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