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POLICY ISSUE

(NEGATIVE CONSENT)

January 8, 1991

SECY-91-007

For: The Commissioners

From: James R. Shea, Director, International Programs
Office of Governmental and Public Affairs

Subject: NRC PARTICIPATION IN THE IAEA'S RADWASS PROGRAM

Purpose: To inform the Commission of a new International Atomic Energy Agency (IAEA) program and of staff views on NRC participation.

Background: In the enclosed letter to NRC and its attachments (Enclosure A), Carl Cooley (DOE) described activities which the IAEA plans to undertake in the nuclear waste management area under its RADWASS (Radioactive Waste Safety Standards) program and advised us of the IAEA request for U.S. participation on the program's five technical committees.

Mr. Cooley, who is the U.S. member on the IAEA International Waste Advisory Committee, requested NRC input on three subjects:

1. Recommendations about participation in the RADWASS program.
2. A list of proposed participants in the five planned technical committees. (A tentative list of possible U.S. participants, including NRC, prepared by the IAEA)

Contact:
Hans B. Schechter, GPA/IP
49-20775

NOTE: TO BE MADE PUBLICLY AVAILABLE WHEN THE FINAL SPM IS MADE AVAILABLE.

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Secretariat is shown on the fourth page of Attachment 2 to Mr. Cooley's letter.)

3. NRC comments on the RADWASS program, as described in the attachments to Mr. Cooley's letter, for inclusion in the consolidated U.S. position which DOE would transmit to the IAEA.

Based on a preliminary review of the issues, the staff advised Mr. Cooley informally that it would not be able to comply with the November 21 and 30 dates he had proposed. This was followed by an interim reply (Enclosure B) informing him that, in view of the large scope of the RADWASS program and the considerable resources NRC would have to devote to any broad support of such an effort, Commission guidance would have to be obtained before a final NRC position could be reached.

Discussion:

The IAEA is proposing a six-year effort devoted to the preparation of safety reference standards on fundamentals of managing all forms of nuclear waste. Such an effort is consistent with the European Community's long-time goal of working toward the harmonization of technical rules and norms in the nuclear area. The IAEA plans to establish five technical committees in the areas of: Planning, Pre-disposal, Disposal, Decommissioning, and Mill-Tailings. The IAEA notes that the documents to be prepared are intended to be consistent with other Agency standards, e.g., those for reactor safety, radiation protection, transportation and spent fuel. A group of consultants to the IAEA's Division of Nuclear Fuel Cycle and Waste Management recommended to them that RADWASS priorities, in descending order of importance, be focused on the following subject areas: low level waste treatment, storage, and disposal; radioactive sources and disposal; and lastly, high level waste storage and disposal, including spent fuel.

The RADWASS program as outlined in the enclosed material appears to be a well-thought-out effort by the Agency for assembling and integrating in a series of documents information developed by many of its member countries. As such, it would offer NRC an opportunity to influence the content of the final product through direct involvement during the early phases of the program. However, the staff is also mindful of staff resource limitations, particularly in the low level waste management area, and the considerable

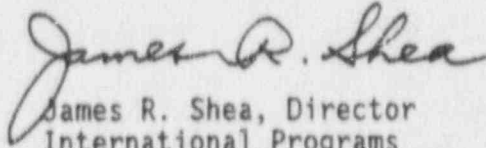
impact a significant involvement in RADWASS would have on other high-priority, ongoing nuclear waste activities and programs.

NRC should continue to support waste management activities of the OECD Nuclear Energy Agency (NEA) and the IAEA as a high-priority effort in accordance with NRC's international program priorities and the Commission's policy and program directives. Accordingly, NRC should continue to divide its international waste involvement between the NEA (on high level waste matters) and the IAEA (for all other waste forms). However, in view of NRC's resource limitations and in consideration of the best way to optimize our involvement and DOE's planned participation, the EDO believes that staff should plan to provide only limited, periodic assistance to the RADWASS effort, consisting mainly of monitoring that NEA findings and results are utilized by the IAEA and paying particular attention to verifying that the Standards and Guides being developed by the IAEA are consistent with, and do not duplicate, the high level waste (HLW) work performed under NEA sponsorship. In this regard, NRC's effort is facilitated by the fact that two previous NRC staff members with extensive nuclear waste experience are working for the two agencies--Dan Galson (NEA) and Mike Bell (IAEA).

In the non-HLW areas, the EDO staff would continue to support ongoing IAEA programs at current levels of effort. While staff have the expertise to make substantive contributions to the RADWASS program, active participation would place an undue burden on limited resources. Therefore, in its response, the staff would inform Mr. Cooley that we are able to provide only limited, periodic help to this program and are unable to participate routinely on RADWASS technical committees or in the preparation of RADWASS documents.

Recommendation: Unless the Commission directs otherwise, within two weeks of the issuance of this paper, GPA/IP plans to send Mr. Cooley the letter proposed in Enclosure C.

This paper has been coordinated with the EDO. OGC has no legal objection.



James R. Shea, Director
International Programs
Office of Governmental and
Public Affairs

Enclosures:

- A. 10/19/90 DOE Letter CRCoolley to
JRShea, GPA/IP, w/attachments
- B. 12/10/90 NRC Letter JRShea to
CRCoolley
- C. 12/14/90 Draft NRC Letter JRShea
to CRCoolley

SECY NOTE: In the absence of instructions to the contrary, SECY will notify the staff on Wednesday, January 23, 1991 that the Commission, by negative consent, assents to the action proposed in this paper.

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ENCLOSURE A



Department of Energy

Washington, DC 20585

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OCT 24 1990

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OFFICE
INTERNATIONAL
PROGRAMS

John R. Shea, Director
International Programs
Office of Governmental and
Public Affairs
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, Maryland 20852

Dear Mr. Shea:

As the International Atomic Energy Agency (IAEA) appointed member of the IAEA Waste Advisory Committee for the United States, I am transmitting to you the following information: (1) a trip report on the International Waste Advisory Committee (INWAC) consultants meeting on Radioactive Waste Safety Standards (RADWASS) Program (Attachment 1); and (2) a letter from IAEA with the enclosed description of the RADWASS program (Attachment 2). Close coordination will be necessary on the U.S. participation in the suggested committees and the U.S. positions on the various standards. I am particularly concerned that each of us learn from the participants specific issues or positions developed by the committees that would be sensitive to the U.S. waste management programs, policies, and regulations.

Please note the IAEA request for participants on the committees. If the U.S. wants to be involved in the positions being taken on these committees, strong U.S. participation is advisable. May I have your recommendations, along with a dossier of your proposed participants on the committees by November 21, 1990. The participation will be coordinated with the Department of Energy's Office of International Affairs (IE) before decisions are made on the participants and, if necessary, we can meet with you on the approach. (1)

If you presently have comments on the RADWASS program, I will consolidate them as a U.S. position, work with IE, and provide them to the IAEA. I should receive your comments no later than November 30, 1990. (2)

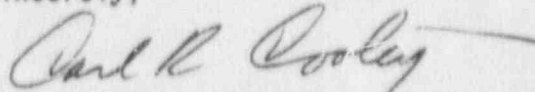
The IAEA is placing a concerted effort to consolidate various information on waste management into an organized set of reference standards. While these will not be necessarily binding, they form a reference which may need addressing if there is significant deviation from the IAEA standards in any country. Depending on the success of the standards, a later move by IAEA to make them more binding may occur.

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The next meeting of INWAC is scheduled in May 1991. As soon as I am aware of the agenda for the meeting, I will make the various issues available to you or whomever you designate for comment.

Sincerely,



Carl R. Cooley, Acting Director
Division of Demonstration, Testing
and Evaluation
Office of Technology Development

2 Attachments

cc:

R. Browning, NRC
R. Bernero, NRC

y-nea



Department of Energy
Washington, DC 20585

OCT 19 1990

Robert M. Bernero, Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, Maryland 20852

Dear Mr. Bernero:

As the International Atomic Energy Agency (IAEA) appointed member of the IAEA Waste Advisory Committee for the United States, I am transmitting to you the following information: (1) a trip report on the International Waste Advisory Committee (INWAC) consultants meeting on Radioactive Waste Safety Standards (RADWASS) Program (Attachment 1); and (2) a letter from IAEA with the enclosed description of the RADWASS program (Attachment 2). Close coordination will be necessary on the U.S. participation in the suggested committees and the U.S. positions on the various standards. I am particularly concerned that each of us learn from the participants specific issues or positions developed by the committees that would be sensitive to the U.S. waste management programs, policies, and regulations.

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Division of Demonstration, Testing
and Evaluation
Office of Technology Development

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cc:

R. Browning, NRC

J. Shea, NRC



Department of Energy
Washington, DC 20585

OCT 19 1990

Robert E. Browning, Director
Division of High Level Waste Management
Office of Nuclear Material
Safety and Safeguards
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, Maryland 20852

Dear Mr. Browning:

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Carl R. Cooley, Acting Director
Division of Demonstration, Testing
and Evaluation
Office of Technology Development

2 Attachments

cc:

J. Shea, NRC
R. Bernero, NRC

United States Government

Department of Energy

memorandum

DATE JUN 6 1990

REPLY TO
ATTN OF EM-55 (Cooley:35531)

SUBJECT: Report of Foreign Travel by C. Cooley, Acting Director, Demonstration,
Testing and Evaluation Division

TO: C. W. Frank, EM-50

PURPOSE: To serve as a consultant to the International Atomic Energy Agency Division of Nuclear Fuel Cycle and Waste Management on establishment of Safety Standards for Waste Management at IAEA expense.

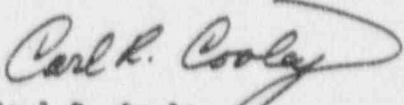
LOCATION: IAEA, Vienna, Austria

DATE: April 2 to April 6, 1990

SUMMARY: The consultants group included R. Rometsch, SZ, D.K. Pichter, DRG U. Niederer, SZ and C. Cooley, US. The group provided the IAEA with a review of the Radioactive Waste Safety Standards (RADWASS) proposed by the IAEA. The general concept of safety standards was supported by the consultants. Existing IAEA documents will be used as a resource to prepare the safety standards organized in a hierarchy of specific waste management functions. The next six years would be required to complete the standards. It is likely that the top level standard on fundamentals for waste management may provide the basis for a future international convention on waste management to seek agreement among the member countries on the fundamental requirements for waste management.

A number of changes were recommended and are included in the attached report provided to the IAEA.

BENEFITS: Participation provided an opportunity to assist the IAEA in planning a future course of direction that keeps the IAEA waste management activities aligned with their customary role. The discussions provided insight into the level of importance of various waste management issues in foreign countries. This perspective and background provided a resource for planning waste management programs in the U.S. Generally, the order of priority are low-level waste treatment, storage and disposal, radioactive sources and disposal, and high-level waste storage and disposal including spent fuel.


Carl R. Cooley
Acting Director
Division of Demonstration,
Testing and Evaluation
Office of Technology Development

Attachment

RECOMMENDATIONS OF THE CONSULTANTS GROUP FOR RADWASS

The consultants group was convened by the Division of Nuclear Fuel Cycle and Waste Management in Vienna April 2 to April 6, 1990 to review available information on the proposed Radioactive Waste Safety Standards and provide recommendations.

OBJECTIVES

Specific objectives were to:

1. recommend the structure for RADWASS
2. recommend the hierarchy, content and scope of documents to be produced under RADWASS
3. recommend the priority, number, and title of standards at the higher levels of the document structure
4. recommend the content of the first phase under RADWASS
5. recommend the disposition of documents now under preparation

BACKGROUND

The consultants group had available as resources: (1) the existing IAEA documents related to waste management, (2) the consultants' report, "Review of the IAEA Safety Series Documents", February, 1990, (3) the IAEA staff working paper on RADWASS, February 26, 1990, and (4) Guide for Originators of IAEA Safety Related Publications, November 1988.

COMMENTS AND RECOMMENDATIONS

The consultants group unanimously agreed that RADWASS is needed and should be implemented by IAEA with sufficient resources to complete the fundamentals, the standards and guides within six years. RADWASS was viewed as a high

priority effort that will: (1) bring credibility and a better image to waste management, (2) bring a better understanding of the importance of waste management, (3) align the Agency's resources with the most important issues, (4) structure the Agency's work to produce effective, concise and easily understandable documents as usable references by member countries, and (5) markedly assist member countries in implementing national waste management programmes. The visibility of the Agency's role in providing safety standards for all aspects of nuclear energy will be significantly enhanced.

The group was impressed with the planning already done to implement RADWASS as initiated by the Secretariat and supported by INWAC. The Division has carefully planned the basis of RADWASS and is giving it high priority.

The needs for standards and guides may change in the future. Preparers of the standards should be cognizant of the evolving needs for environmental remediation, environmental restoration and mixed waste management; however, near term emphasis of RADWASS should be on encouraging the use of preventive measures to avoid future problems.

The group developed the following recommendations:

A. Structure

RECOMMENDATION No. 1: A fundamentals document on radioactive waste management giving the concepts and basic principles is a first and foremost requirement.

A separate fundamentals document in the RADWASS programme is considered necessary in addition to the planned fundamentals documents in the fields of radiation protection and nuclear safety. The complex technical and safety issues of radioactive waste management require: (1) special focus on the long-term ethical requirements of society, (2) combined broad multi-disciplinary attention to an integrated systems approach, and (3) the unique coupled relationship of engineered facilities and the geosphere. These aspects and the growing public concern about safety brings out waste management as an area which requires special attention.

A single fundamentals document will provide the principal focus and direction to international programmes. It will guide the development of waste management in member states and reduce the likelihood of serious waste management incidents in the future.

The fundamental document could be written with the possibility in mind that it may be the focus of an international convention involving potentially binding agreements.

RECOMMENDATION No. 2: The Agency should have a generic waste management system description to provide a consensus on the components of the system as used by IAEA and to provide a common understanding among the authors, reviewers, and users of RADWASS documents and other IAEA safety related publications. It should be part of the Fundamentals document.

The availability of a reference system description provides the mechanism to achieve the consistent well structured documentation sought by the Division of Nuclear Fuel Cycle and Waste Management. The system description should be oriented on major functions expected of each component of the system. The terminology and structure of all RADWASS documents should be made consistent with the reference waste management system description and with other Agency standards, e.g. NUSC, radiation protection, transportation and spent fuel. The time invested in preparation of a systems description will be saved many-fold through elimination of lengthy discussions about the meaning and content of terms and the scope of all documentation related to waste management.

RECOMMENDATION No. 3 Because of the importance and impact of terms, definitions of all of the key words used in RADWASS documents should be included in each document (fundamentals, standards, and guides).

Consistency should be ensured among the different RADWASS documents and the Waste Management Glossary should be updated accordingly.

RECOMMENDATION No. 4: The RADWASS structure should combine the system functional structure with emphasis on the type of waste involved and the facilities used.

This provides a user orientation. It can be accomplished by using the functional structure for the standards and orientation of the guides into waste type and user facilities as part of the scope. The basic fundamentals, standards and guides would form the governing references for safety practices, technical reports and TECDOC reports.

B. Hierarchy, Content, and Scope.

RECOMMENDATION No. 5: The hierarchy proposed in the working document, i.e. Safety Fundamentals, Safety Standards, Safety Guides, Safety Practices, and technical documents is appropriate.

The fundamentals should give the objectives, basic principles, and concepts which are used to define what shall be done (standards) and how it should be done (guides).

RECOMMENDATION No. 6: A document explaining RADWASS, its purpose, content and scope and mandatory requirements is necessary to provide clear guidance to future planners and authors of the RADWASS documents.

Uniformity and consistency in the proposed fundamentals, standards and guides must be achieved. The document should state specific control requirements for the RADWASS including standardization of certain terminology. For example, the standards (explaining what shall be done) should include "standards" statements using "shall". The guides (explaining how it can be done) should contain "criterion" statements using "should". "Requirements" statements may be used in the guides to support the criteria. Guidance from the SSRC and examples on the uniform use of regulatory terminology are needed.

RECOMMENDATION No. 7: The Safety Standards as shown in Annex 1 should include the following:

1. Planning for a National Radioactive Waste Management System.

This standard should include "standards statements" on policy, laws and regulations, and organizational structure (e.g., regulatory and implementing organizational roles), institutional responsibilities,

surveillance, funding, research, liability, emergency planning, classification of waste, exemption or release, minimization of waste, quality assurance and quality control, approval requirements, control and tracking (flow control), records, coordinating requirements and safety and environmental documentation.

2. Pre-disposal Management of Radioactive Waste.

This standard should include functions relative to: (1) all types of waste generation, (2) handling and treatment, and (3) conditioning to produce storable or disposable forms of waste and (4) interim storage before disposal. (e.g., the functions occurring in facilities for enrichment, fuel fabrication, nuclear power generation, reprocessing, waste processing, decontamination and environmental restoration, supporting laboratories, and other facilities for medicine, industry and research. Transportation should be included by reference to other IAEA standards.

3. Near-Surface Disposal of Short-Lived Radioactive Waste.

This standard covers the disposal of short-lived radioactive wastes in repositories which are constructed on the surface or in shallow ground and for which the post-closure safety relies at least for some period of time - on institutional controls in addition to engineered barriers.

The standard should include statements on classification of waste suitable for disposal in a near-surface repository (including definition of acceptable levels of contamination of the waste with long-lived nuclides), site selection, design and construction of repository, operation, quality assurance (in particular with respect to waste acceptance), closure, safety assessment, intrusion scenarios, model validation, radiological protection during operation and in the post-closure period, institutional requirements for the post-closure period, administrative and regulatory requirements.

4. Geologic Disposal of Radioactive Wastes

This standard covers the disposal of all types of radioactive waste (including both long-lived and short-lived waste but excepting mine and mill tailings) in consolidated geologic media below the surface at appropriate depth. In addition to engineered barriers, the post-closure safety relies on geological barriers but not on institutional control.

The standard should include statements on site-selection, design and construction of the repository, operation, quality assurance, safety assessment, model validation, radiological protection during operation and in the post-closure period, administrative and regulatory requirements. For the case of long-lived waste, it should also include statements on the long-term safety aspects.

5. Management of Wastes from Mining and Milling of Ores containing Uranium and Thorium.

This standard should include the requirements for: (1) the minimization, collection, treatment and discharge/disposition of the solid, liquid and airborne wastes from the development and operation of mines handling radioactive ores (including the in situ leaching) and the operation of the ore mills and (2) the decommissioning of the mining and milling facilities. Emphasis should be given on the siting, design, operational control, stabilization, environmental restoration and long-term surveillance of mill tailings impoundment and waste rock piles (including controlling their use as construction material).

The standard should primarily address the radiological hazard of the waste but should also give due consideration to its chemical hazards of the waste. The standard should also be applied to mining and milling of other ores producing wastes containing radiologically significant amounts of uranium, thorium, and their decay products.

6. Decommissioning

In addition to complete decommissioning and environmental restoration, the standard should include sealing and entombment. Decommissioning should also emphasize the need to design facilities for decontamination and decommissioning. The standard covers decommissioning of all facilities except for mining and milling. Included are non-nuclear facilities for metal, industry, research, accelerators, etc.

In some instances, the decision to seal the facility or entomb it may be chosen with its attendant surveillance requirements. The scope of decommissioning should include exemption levels for release of materials for other uses whether recycled or used external to the originating facility.

The use of appropriate designs and material choices for future decontamination and decommissioning would be included as part of the requirements to greatly reduce the amount of radiation dose and the amount of waste resulting from discontinued operations.

RECOMMENDATION No. 8: A standard on Disposal at Sea should not be included in the present RADWAS given the current London Convention moratorium on sea dumping.

Sufficient information has already been planned or developed by the Agency to fulfill its role in the London Dumping Convention; however, the Agency should maintain its competence in this field.

RECOMMENDATION No. 9: A Standard on Environmental Restoration and Post Accident Waste Management will likely be required in the future but should not be included in the planning of Phase II.

Accidents, pre-existing situations (old burdens) and changing regulations will require remediation. Public demands to restore previously used areas for other uses will require environmental restoration. The evolution of this activity is not yet mature enough to warrant a standard. Decommissioning is not included in this standard.

RECOMMENDATION No. 10: The following guides as shown in Annex 1 should be prepared:

Standard No. 1, Planning for a National Radioactive Waste Management System should be accompanied by three guides:

- 1.1 Classification of Radioactive Waste
- 1.2 Organizational and Planning Requirements for a Waste Management System (creating appropriate waste management programs)
- 1.3 Implementation and Conduct of Management of Radioactive Waste

Standard No. 2, Predisposal Management of Radioactive Waste should have six guides:

- 2.1 Collection and Treatment of Low and Intermediate Level Waste at Nuclear Facilities (non alpha and non-high level)
- 2.2 Collection and Treatment of Low and Medium Level Waste at Medical, Industrial and Research Institutions. (non-alpha and non-high)
- 2.3 Collection and Treatment at Facilities producing SF, HLW and Alpha Waste
- 2.4 Conditioning of Low and Intermediate Level Waste
- 2.5 Conditioning of Spent Fuel, High-Level Waste and Alpha Waste.
- 2.6 Storage of Conditioned Radioactive Waste.

Storage in guide 2.6 would be that done before disposal in long-term centralized facilities. Storage of unconditioned waste is included in Guide 2.3. Transportation would be by reference to other IAEA standards.

Standard No. 3, Near Surface Disposal of Radioactive Waste, should have three guides:

- 3.1 Siting of Near-surface Disposal Facilities
- 3.2 Design, Construction, Operation and Closure of Near-Surface Repositories
- 3.3 Safety Assessment and Institutional Controls for Near-Surface Disposal

Standard No. 4, Geologic Disposal of Radioactive Waste should have three guides:

- 4.1 Siting of Geologic Disposal Facilities
- 4.2 Design, Construction, Operation and Closure of Geologic Repositories
- 4.3 Safety Assessment for Geologic Disposal

It could be argued whether under these two standards an additional guide is needed on regulation. However, the consultants group believes that with the general regulatory requirements being addressed under Standard No. 1, it is possible to distribute the remaining regulatory requirements among each of the three guides.

Standard No. 5, Management of Wastes from Mining and Milling of Ores Containing Uranium and Thorium

- 5.1 Management of Waste from Mining and Milling Operations
[includes effluents]
- 5.2 Decommissioning of Uranium and Thorium Mines and Mills and Environmental Restoration for Mines and Mills, Waste Rock and Mill Tailings. [includes facilities decontamination, environmental restoration of the site, and disposition of the waste rock/soil and closure of the site]

Standard No. 6, Decommissioning of Nuclear Facilities, should have two guides:

6.1 Decommissioning of Nuclear Power and Fuel Cycle Facilities.

6.2 Decommissioning of Medical, Industrial, and Research Facilities.

[The scope includes research reactors and accelerators etc.]

RECOMMENDATION No. 11: The outline of the standards and guides should reflect four main topical areas where they are relevant to the topic of the standard: administrative; regulatory; siting, design and construction; and operation.

Administrative

- planning
- organizing
- classifying into categories
- qualifying and training
- records, funding, quality assurance, reporting
- safety reports, routine reporting

Regulatory

- radiation protection requirements
- regulations to be developed
- licensing procedures
- surveillance
- exemption levels
- safety assessment & reporting
- effluent releases (by reference to other IAEA standards)

Siting, Design, and Construction

- site selection criteria
- design criteria
- material selection criteria
- waste minimization strategy

Operations

- operating criteria
- segregation of waste
- minimization of waste generation
- minimization of waste volumes
- recycle and reuse
- characterization of waste
- monitoring
- emergency planning (unplanned events)
- waste acceptance criteria
- packaging
- shut down
- decontamination (methodology, waste minimization and release levels
- termination of operations

C. Priorities

RECOMMENDATION No. 12: The following order of priority is recommended for the preparation of RADWASS documents.

Very High Priority

Waste Management Fundamentals and the supporting document on the RADWASS charter, structure and requirements

High Priority Standards

- S 1. Planning for a National Radioactive Waste Management System
- S 2. Pre-disposal Management of Radioactive Waste *H/L + LLW*
- S 3. Near Surface Disposal of Short-Lived Radioactive Waste *LLW*
- S 4. Geologic Disposal of Radioactive Waste *last*

High Priority Guides

- G 1.1. Classification of Radioactive Wastes
- G 1.2. Organization and Planning Requirements for a Waste Management System
- G 2.2. Collection and Treatment of LILW at Medical, Industrial and Research Institutions
- G 3.1. Siting of Near Surface Disposal Facilities
- G 4.1. Siting of Geologic Disposal Facilities

All other documents are medium priority.

D. Content of the First Phase

RECOMMENDATION No. 13: At a minimum, the content of the first four-year phase (1991-1994) should include completion of: (1) the fundamentals, (2) the high-priority standards, and (3) the high-priority guides. The goal should be to complete all of the currently planned standards and guides in six years.

Disposition of Existing Documents

RECOMMENDATION No. 14: The existing documents contain much of the information needed to prepare the RADWASS standards, guides and practices. Some information can be used directly. Other information requires updating.

The consultants group briefly reviewed the Safety Series documents and Technical documents published during the past 12 years under the Agency's waste management program and their relevance to the RADWASS program. Most of the documents provide the required input to RADWASS. In many cases, provisions in these documents can directly be used. This is particularly true for the Safety Series documents prepared within the Agency's underground disposal program. The content of these documents have, however, to be reorganized, reviewed and in some cases considerably be expanded (e.g., planning of waste management systems, uranium mining and milling), in order to fit into the RADWASS hierarchy.

Concerning the Safety Series documents currently under preparation in the Waste Management Section, the group recommends the actions indicated in Annex 2.

Implementing and Management of RADWASS

RECOMMENDATION No. 15: In implementing RADWASS, the Agency should establish a core steering and review group (CSRG) which would be responsible for assisting the Secretariat in planning the details and content of each standard and reviewing draft documents and the written comments solicited from the INWAC members. The CSRG should review the fundamentals document and all standards and guides. Annex 3 shows the process for reviewing of the documents by CSRG. The consultants are concerned that reasonable technical review be achieved before publication. Therefore, we are recommending that the CSRG be established with the following functions:

- (1) define content of documents
- (2) recommend preparation
- (3) review documents
- (4) recommend issues for INWAC consideration (Fundamentals and Standards)
- (5) recommendations to the Secretariat (Guides)
- (6) coordinate with other programmes

RECOMMENDATION No. 16: A planned and consistent hierarchy of future documents for the safety practices and technical documents which key to the standards is highly recommended.

Organization of planned documents by titles and content should be beneficial in letting Member States know what subjects will be covered in the future. It provides INWAC with information on what the Agency plans to do and approximately when it will be done.

P=1
WASTE MANAGEMENT FUNDAMENTAL

S T A M D A R D S G U I D E S	1 P=2	2 P=2	3 P=2	4 P=2	5 P=3	6 P=3
	Planning for national radioactive waste management systems	Pre-disposal management of radioactive waste	Near-surface disposal of short-lived radioactive wastes	Geologic disposal of radioactive wastes	Management of wastes from mining and milling of ores containing uranium and thorium	Decommissioning of facilities
	1.1 P=2	2.1 P=3	3.1 P=2	4.1 P=2	5.1 P=3	6.1 P=3
	Classification of radioactive wastes	Collection and treatment of LILW at nuclear facilities	Siting of Near-surface Disposal Facilities	Siting of Geologic Disposal Facilities	Management of wastes from mining and milling operations	Decommissioning of nuclear facilities
1.2 P=2	2.2 P=2	3.2 P=3	4.2 P=3	5.2 P=3	6.2 P=3	
	Organization and planning requirements for W.M.S.	Collection and treatment of LILW at medical, industrial and research institutions	Design, Construction Operation and Closure of Near Surface Repository	Design, Construction Operation and Closure of Geologic Repositories	Decommissioning of U and Th mills and environmental restoration of waste rock and mill tailings	Decommissioning of Medical, Industrial and Research Facilities
1.3 P=3	2.3 P=3	3.3 P=3	4.3 P=3			
	Implementation and conduct of waste management	Collection and treatment of radioactive waste at facilities producing SF, HLW and alpha waste	Safety Assessment and Institutional Controls for Near-Surface Disposal	Safety Assessment of Geologic Disposal		
		2.4 P=2				
		Conditioning of LILW				
		2.5 P=3				
		Conditioning of SF, HLW, alpha				
		2.6 P=3				
		Storage of conditioned radioactive wastes				

Priorities (P)
1 = very high
2 = high
3 = medium

ANNEX 2

Recommended actions on Safety Series Document
Currently under Production in
Waste Management Section in regard to RADWASS

<u>Category originally planned</u>	<u>Title</u>	<u>Responsible Officer</u>	<u>Status</u>	<u>Recommended Action</u>
1. Safety Guide	The Regulatory Process in the Decommissioning of Nuclear Facilities	De	Approved for Publication	Publish as approved by SSRC with remarks in Foreword
2. Safety Guide	Design and Operation of Radioactive Waste Incineration Facilities	Efremenkov	with SSRC	
3. Safety Guide	Operation, Shutdown and Closing of Deep Geological Repositories	Bell	Completion 1992	Expand to become RADWASS Guide 4.2
4. Safety Guide	Performance and Safety Assessment of Radioactive Waste Repositories	Bell	Completion 1992	Should become RADWASS 4.3
5. Safety Guide	Siting, Design and Construction of a Deep Geological Repository for Disposal of High-level and Alpha-Bearing Wastes	Squires	Completion 1990	Publish as TECDOC and use it as source for Guides 4.1-4.3
6. Safety Practices	Application of Exemption Principles to the Recycle and Reuse of materials from the Nuclear Fuel Cycle	Linsley	Completion 1990	Publish as a Safety Practice under Standard in area 1
7. Safety Practices	Application of Exemption Principles to Wastes Arising from Radioisotope uses in Hospitals and Research Establishments	Linsley	Completion 1991	
8. Safety Practices	Application of Exemption Principles to the Marine Disposal of Radioactive Wastes	Calmet	Completion 1993	Continue as planned as activity exercise in the IAEA role under the London Dumping Convention

These documents are not part of the RADWASS programme to be commenced in 1991, but will later be included as indicated.

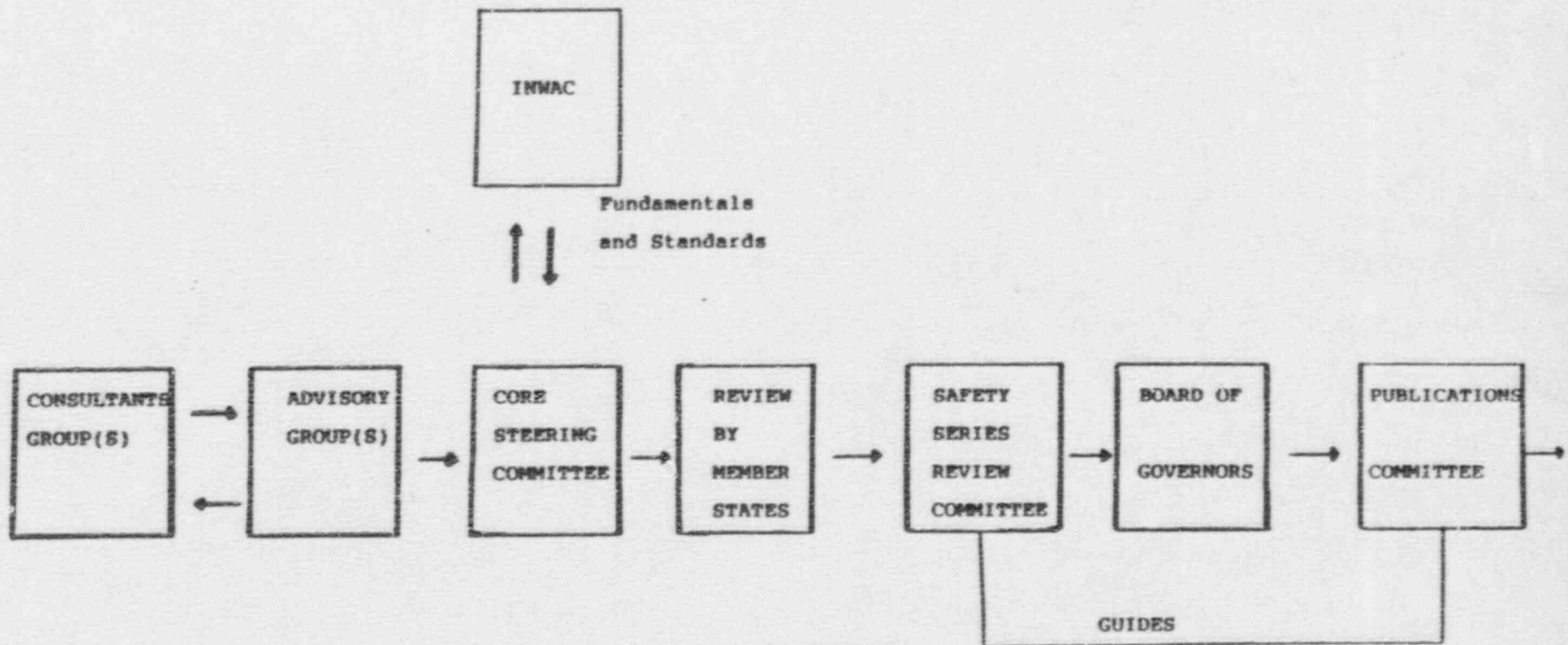
CORE STEERING AND REVIEW COMMITTEE

MEMBERSHIP

- . STANDING COMMITTEE
- . 5-10 MEMBERS
- . SOME INWAC MEMBERS
- . OTHER SPECIALISTS

FUNCTIONS

- . RECOMMENDS PREPARATION
- . DEFINES CONTENT
- . REVIEWS DOCUMENTS
- . RECOMMENDS ISSUE TO INWAC (FUNDAMENTALS AND STANDARDS)
- . COMMENTS TO SECRETARIAL (GUIDES)
- . COORDINATES WITH OTHER PROGRAMS



RECOMMENDED PROCESS FOR REVIEW OF FUNDAMENTALS, STANDARDS AND GUIDES

OCT 11 1990



ATTACHMENT 2

INTERNATIONAL ATOMIC ENERGY AGENCY
AGENCE INTERNATIONALE DE L'ENERGIE ATOMIQUE
МЕЖДУНАРОДНОЕ АГЕНТСТВО ПО АТОМНОЙ ЭНЕРГИИ
ORGANISMO INTERNACIONAL DE ENERGIA ATOMICA

WAGRAMERSTRASSE 5, P.O. BOX 100, A-1400 VIENNA, AUSTRIA
TELEX: 1-12645, CABLE: INATOM VIENNA, FACSIMILE: 43 1 234564, TELEPHONE: 43 1 2360

IN REPLY PLEASE REFER TO:
PRIERE DE RAPPELER LA REFERENCE

DIAL DIRECTLY TO EXTENSION
COMPOSER DIRECTEMENT LE NUMERO DE POSTE

T2.03.6

1990-09-27

Sir,

Enclosed please find the revised RADWASS Programme Document which reflects comments made by INWAC members and by the Agency's Safety Series Review Committee. You will note that the revised Programme is based on an intermediate level of resources between what had been budgeted for 1991/92 and the consultants' recommendations. At this resource level, we plan to be able to complete nine of the ten high priority documents recommended by the consultants to be prepared during Phase I of RADWASS.

Steps are under way to begin to implement the programme, with consultant meetings being scheduled this fall to begin drafting the Safety Standard for Near Surface Disposal and Safety Guides on Siting of Near Surface and Deep Geologic Disposal Facilities. Consultant meetings are planned for early next year on the Safety Fundamentals document and the Waste Classification System Safety Guide, and meetings of several of the Standing Technical Committees are planned for the second quarter of 1991.

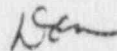
In this regard, one of our high priority tasks is to identify* members for the five Standing Technical Committees. These should be experts with a broad understanding of waste management technology and policies in their Member State, who would be available to attend, on the average, one Technical Committee meeting per year for the next several years. We would appreciate your suggestions of candidates from your Member States whom we could then request be nominated through the respective Missions. Enclosed is a tentative list of candidates identified by the Secretariat.

Mr. C. Cooley
Acting Director
Division of Demonstration, Testing,
and Evaluation
Department of Energy
Washington, D.C. 20585
USA

I would appreciate any suggestions you may have for additions or deletions from the list, preferably by October 31, 1990.

Thank you for the comments and suggestions you made to help improve the RADWASS Programme Document. I look forward to hearing from you about suggestions for the STCs and to seeing you at the next INWAC meeting, which is tentatively scheduled for 8-12 April 1991.

Sincerely yours,



D.E. Saire
Head, Waste Management Section
Division of Nuclear Fuel Cycle
and Waste Management

Enclosures

RADWASS STANDING TECHNICAL COMMITTEES

<u>Country</u>	<u>Planning</u>	<u>Pre-Disposal</u>	<u>Disposal</u>	<u>Decommissioning</u>	<u>Mill Tails</u>
Argentina		M. Oyuela		P. Sajaroff	
Australia					K. Cannon
Belgium		J. Claes			
Canada	G. Jack	R. Kohout	D. Cameron K. Nuttal	G. Jack	G. Jack
CSFR	Z. Dlouhy	F. Malasek I. Kallonen			
France	A. Chapuis P. Jourde	Y. Marque	A. Chapuis Y. Marque	A. Sugier	
FRG	R. Randl	E. Warneke	W. Brewitz K. Kühn	L. Weil	
GDR	D. Richter	D. Richter			
India		M. Kumra		A. Prasad	
Italy	M. Larnia	A. Bertini	F. Gera	M. Larnia	
Japan	M. Ijuin	H. Kuribayashi	Y. Audo	Y. Kawakami	
Netherlands	J. Vrijen				
Spain			P. Carboneros		J. Santiago

RADWASS STANDING TECHNICAL COMMITTEES

<u>Country</u>	<u>Planning</u>	<u>Pre-Disposal</u>	<u>Disposal</u>	<u>Decommissioning</u>	<u>Mill Tails</u>
Sweden	C. Bergman A. Larsson	C. Bergman N. Christensen N. Rydell	C. Bergman P. Ahlström A. Larsson T. Papp H. Forsström	C. Bergman	
Switzerland	U. Niederer R. Rometsch	J. Aeppli	U. Niederer E. Kowalski C. McCombie R. Rometsch		
U.K.	M. Hill	A. Duncan R.C. Grey	N. Chapman P. Grimwood M. Hill L. Johnson	A. Colquhoun	
USA	R. Bangart C. Cooley P. Lakey J. Bresee J. Saltzman E. Browning M. Wacks	L. Oyen T. Johnson	J. Greeves K. Kim D. Woodrich M. Voegele	T. Johnson J. Greeves	E. Hawkins J. Greeves
USSR		A. Poljakov			
NEA/OECD				O. Ilari	O. Ilari
Uranium Inst.					P. Vernon

RV URFO

INTERNATIONAL ATOMIC ENERGY AGENCY

The Radioactive Waste Safety Standards (RADWAS) Programme

23 August 1990

Waste Management Section
Division of Nuclear Fuel Cycle and Waste Management

FOREWORD

The purpose of this document is to describe current plans for the establishment of the Radioactive Waste Safety Standards (RADWASS), a new series of Agency documents in the Safety Series intended to set out internationally agreed approaches to the safe management of radioactive wastes.

The present document has been reviewed by the International Radioactive Waste Management Advisory Committee (INWAC) and the Agency's Safety Series Review Committee (SSRC). RADWASS is expected to be completed in two Phases. The document presents the Agency's strategy for Phase I (1991-1994). It is planned that the programme be reviewed in 1993 to determine the implementation rate and the needed resources for Phase II, after some experience has been gained in the Programme.

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The Radioactive Waste Safety Standards (RADWASS) Programme

1. Introduction

The Agency is being regularly requested to assist Member States in providing evidence that radioactive wastes can be managed safely. More specifically, it is being asked to help demonstrate that there is harmonization of approach at the international level by promulgating standards. In response, the Director General proposed to the Agency's Secretariat in 1988 that consideration be given to establishing a special series of safety documents devoted to radioactive waste management.

Although more than thirty publications in the IAEA Safety Series have been issued on the subject of radioactive waste management covering most areas of importance, the documents were prepared during the phase when philosophies and technologies were still emerging and as a result, some are considered as being interim documents. During this phase, it was not easy to establish an ordered and coherent document structure. There is therefore a need to revise and reorganize the Agency's publications in the waste management area.

The Radioactive Waste Safety Standards (RADWASS) series of documents is therefore being developed (i) to improve the visibility and status of Agency safety documents in the waste management area and thereby to make more evident the harmonization which exists in the approaches to establishing safety in this area at the international level and (ii) to impose an improved and more logical structure on publications in the waste management area.

A number of basic points regarding the planning of the new series emerged from the preliminary discussions of the International Radioactive Waste Management Advisory Committee (INWAC) and the Agency's Secretariat^{1/}.

^{1/} INWAC has been established to advise and guide the Agency in the planning and implementation of its programme on radioactive waste management.

They are as follows:

- a) the RADWASS document series should be structured in a logical and clear manner so as to reflect the way in which safety is achieved in the waste management area. It should be consistent with the guidance of the Agency's Safety Series Review Committee (SSRC) on safety related document production (see Section 2).
- b) the series should encompass all safety related documents in the waste management area.
- c) RADWASS will be headed by a single Safety Fundamentals document.
- d) the existing waste management documents in the Safety Series will gradually be supplanted by new and revised documents developed within the RADWASS framework.
- e) because of the limited resources which can be employed on RADWASS document development, there will have to be some prioritisation in document production. It seems clear that the development of the Safety Fundamentals, which lays out basic principles, should have highest priority. Next, selected Safety Standards and Safety Guides in areas where there is near-term need will have priority, at the same time recognising that certain lower category documents may also need to be developed in response to pressing demands. Proposals for this prioritisation are made later in this document.

In April 1990, a meeting of experts was convened to consult with the Secretariat on the plans for the RADWASS programme^{2/}. The experts were provided with a working document laying out the Secretariat's ideas on the RADWASS programme. The consultants were asked to make recommendations on 1) the structure of RADWASS 2) the content and scope of documents 3) proposed priorities 4) any gaps or areas of pressing need and 5) the disposition of documents currently being produced. The

^{2/} The experts were C. Cooley (USA), U. Niederer (Switzerland), D. Richter (GDR) and R. Rometsch (Switzerland), all members of INWAC.

experts were supportive of the RADWASS concept and agreed with the general framework envisaged for the series. Their recommendations on documents, priorities, and programme management have been taken into account in the preparation of the present document.

2. Organization of Safety Oriented Publications^{3/}

In June 1988, the Director General approved a new categorization of safety related publications and a system of monitoring the preparation of such publications through the establishment of a Safety Series Review Committee (SSRC), set up to advise the Deputy Director General for Nuclear Energy. A new format and cover design for the Safety Series were developed. As a result of these changes, the preparation of safety related publications will benefit from enhanced inter-divisional coordination and peer review. In addition, the new practice of listing in the back of each book all available publications in the relevant subject area and their status in relation to each other will assist the user of Agency publications.

The approach adopted for the organization of safety related publications involves a matrix concept. A number of technical areas are identified to group together those documents which are mainly devoted to one topic, e.g. to waste management, radiation protection or research reactor safety. Within each of these groups, called Application Areas, a hierarchical structure of four levels is established for the Safety Series publications. (The RADWASS documents cover the radioactive waste management Application Area.)

^{3/} Taken from "Guide for Originators of IAEA Safety Related Publications" (November 1988) issued by the Safety Series Review Committee

The four hierarchical levels are described below along with the relationship of the Safety Series to other types of Agency publications. The hierarchy defines different levels of technical detail and legal relevance and the Standardization of certain terminology within each document category:

(i) Safety Fundamentals

Publications in this category form the top level and are characterized by the presentation of safety concepts, safety objectives and fundamental principles or requirements.

Safety Fundamentals do not go into any technical detail and generally do not present the application of principles. These publications are considered to represent targets for which safety efforts should strive rather than practical requirements to achieve a postulated safety level. The safety objectives and principles of these publications would be implemented via the Safety Standards and Safety Guides which form the next lower levels in the hierarchy.

(ii) Safety Standards

Normally, each Application Area (or in some cases subdivision of an Application Area) will have a publication in this category.

Safety Standards represent the compilation of the basic safety requirements for the area concerned and are formulated on the basis of a broad international consensus. Although they concentrate on basic requirements, explaining what has to be done rather than how it could be done, they present realistic requirements in view of their practical basis.

The language of *Safety Standards* should be close to the language of legal documents in order to facilitate their application. They essentially contain firm requirements ('shall statements') of a mostly regulatory nature and little explanatory text or recommendations.

These publications are obligatory for the Agency's assistance activities and may be adapted, on a voluntary basis, by Member States for application to their national activities.

(iii) *Safety Guides*

In the hierarchy of the *Safety Series* publications these documents form the next lower level, and are characterized by the presentation of recommendations to fulfil one or more requirements or principles of a document higher in the hierarchy. They may take the form of more specific requirements written in an obligatory format ('shall statements') because these are consequential requirements tied to those in a *Safety Standard*, or they may recommend certain ways to implement such requirements (should statements).

The language of *Safety Guides* is accordingly less formal than that of *Standards* and they may contain larger amounts of background information. A conscious use of shall and should is nevertheless required.

(iv) Safety Practices

These publications give practical examples and detailed methods on how to implement certain safety requirements. They may show how to perform specific calculations, may suggest a number of forms to be used in an auditing process, give a collection of data or limits to be used in a specific judgement, etc.

The application of the content of these publications is not obligatory and therefore 'shall' is not to be used. The Safety Practices form the lowest category within the Safety Series.

3. Proposed RADWASS Documents and their content

Various schemes have been considered for the organization of the RADWASS documents. The scheme adopted attempts to take account of the needs of the user by identifying particular user groups in the waste management field, eg. planners and regulators, designers, safety assessors, those concerned with decommissioning, with underground disposal and with mining and milling wastes. At the same time consideration has been given to the different characteristics of the various waste streams and of the methods for their management. Separate documents are proposed to accommodate the most important differences, eg. the pre-disposal management of low and intermediate level wastes (LILW), spent fuel (SF)^{4/} high level (HLW) and alpha bearing wastes, and short-lived wastes in the disposal context.

RADWASS is intended to provide requirements, criteria and guidance for management of radioactive waste. To the extent that chemically hazardous waste may also be present, these will be considered, so long

^{4/} Storage of spent fuel would be considered in RADWASS when it has been determined that the spent fuel would be treated as waste. Spent fuel which is considered to be part of the nuclear fuel cycle is being addressed in the NUSS programme.

as the characteristics of the radioactive waste control the hazard and the means of disposal. Disposal of primarily chemically hazardous waste is being addressed by other UN organizations.

A single Safety Fundamentals document is envisaged for the Radioactive Waste Management Application Area. Five Subject Areas are identified: Planning, Pre-disposal, Disposal, Uranium and Thorium Waste Management, and Decommissioning. One Safety Standard will be developed under each of these Subject Areas, except for the Disposal Subject Area where two Standards, one for Near Surface Disposal and one for Geologic Disposal, are planned. In total, the present scheme envisages 24 documents made up of 1 Fundamental, 6 Safety Standards and 17 Safety Guides. The scheme,

developed to the level of Safety Guides, is set out in Annex 1. The proposed contents of Fundamentals, Standards and Guides are set out in Sections 3.1 and 3.2.

The documents will be produced in accordance with the Agency Safety Series criteria developed by the Safety Series Review Committee, with format, content and language as described in Section 2. Particular attention will be paid to the use of the appropriate language for the different levels of documents in the hierarchy. The importance of achieving consistency within the series is recognized in terms of concepts and principles but also in terms of the use of words. Each document will contain a section of definitions of the key words used in that document. These will be drawn from a common Glossary, an updated version of the existing Radioactive Waste Management Glossary (ECDOC-447).

To further achieve consistency, there will be a RADWASS manager in the Secretariat, whose function it will be to maintain the Waste Management Glossary, and to ensure consistent application of the Fundamentals in each of the Subject Areas. Further, in each Subject Area, a Standing Technical Committee will review all documents, thereby contributing to consistent approaches and use of terminology in the guides and practice documents that implement a particular Safety Standard. (See Section 6,

3.1 Safety Fundamentals

The proposed scheme envisages an overlying document at the Safety Fundamentals level which will set out the basic safety philosophy for radioactive waste management. The document is intended to provide the principal focus and direction to international programmes and to serve as a guide for the development of waste management programmes in Member States.

Safety Fundamentals - title "Principles for Radioactive Waste Management"

This document should have considerable status as the lead document in RADWASS. It may be expected to be read by many people, politicians, and other laymen, who are not very familiar with the details of waste management. It should therefore contain an introductory overview of the waste management system, emphasizing the "systems approach" to radioactive waste management.

The scope of the document should encompass all aspects of waste management from minimization of the generation of waste to disposal of all types of radioactive waste.

The document should draw out the main and special safety issues in radioactive waste management, in particular, the issues which arise from the need to minimize the possible burden of risk to future generations, while maintaining doses to the current generation "as low as reasonably achievable". The document should set out objectives and principles for:

- (1) radiation and environmental protection, both now and in the future (worker and members of the public)
- (2) minimizing the burden on future generations (financial, social, health)

The document should set out the main approaches by which these objectives will be achieved, including: waste minimization, waste immobilization and containment, storage for decay, release within acceptable limits, isolation in storage and disposal.

It should recommend the use of a systems approach, in which waste management decisions are made with due account being taken of the interactions between the various stages in waste management process, and of the defence in depth or multibarrier concept in waste disposal.

The document should contain a generic waste management system description as a reference system for use in IAEA documents. This will provide a common understanding among authors, reviewers and users of RADWASS documents.

There should be consistency with the Safety Fundamentals documents being developed by other Agency groups, especially that being developed on radiation protection.

The document should be prepared with the possibility in mind that it could be the focus of an international convention involving potentially binding agreements.

3.2 Safety Standards and Safety Guides

The planned hierarchy of Safety Standards and Safety Guides is set out in Annex 1. The proposed contents of the documents are described in the following paragraphs.

3.2.1 Safety Standards

Standard 1. Establishing a National Radioactive Waste Management System.

This standard should include "standards statements" on policy, laws and regulations, and organizational structure (e.g., regulatory and implementing organizational roles), management principles, institutional responsibilities, surveillance, funding, research, liability, principles for classification of waste generation, exemption or release, minimization of waste, quality assurance and quality control, approval and licensing requirements, control and tracking (flow control), safety and performance assessment, records, coordinating requirements and safety and environmental documentation.

Standard 2. Pre-disposal Management of Radioactive Waste.

This standard should address: (1) generation of all types of waste and waste minimization, (2) collection and treatment, including management of liquid and gaseous effluents that arise during collection and treatment, (3) conditioning to produce storable or disposable forms of waste and (4) interim storage for decay or before disposal. It would apply to facilities for enrichment, fuel fabrication, nuclear power generation, reprocessing, waste processing, decontamination and environmental restoration, supporting laboratories, and other facilities for medicine, industry and research. Transportation would be addressed by reference to other IAEA standards.

Standard 3. Near-Surface Disposal of Radioactive Waste.

This standard covers the disposal of radioactive wastes in repositories which are constructed on the surface or in shallow ground and for which the post-closure safety relies, at least for some period of time, on institutional controls in addition to engineered barriers.

The standard should include statements on the classification of waste suitable for disposal in a near-surface repository (including definition of acceptable levels of contamination of the waste with long-lived nuclides), site selection, design and construction of repositories and of engineered barriers, operation, quality assurance and quality control (in particular with respect to waste acceptance), surveillance, closure, safety assessment, radiological protection during operation and in the post-closure period, institutional requirements for the post-closure period, and administrative requirements.

Standard 4. Geologic Disposal of Radioactive Wastes

This standard covers the disposal of all types of radioactive waste (including both long-lived and short-lived waste but excepting mine and mill tailings) in consolidated geologic media below the surface at appropriate depth. In addition to engineered barriers, the post-closure safety relies on geological barriers but not on institutional control.

The standard should include statements on site-selection, design and construction of the repository, operation, quality assurance and quality control, safety assessment, sealing and closure, radiological protection during operation and in the post-closure period, and administrative requirements. For the case of long-lived waste, it should also include statements on the long-term safety aspects of geologic disposal.

Standard 5. Management of Wastes from Mining and Milling of Ores containing Uranium and Thorium.

This standard should include the requirements for: (1) the minimization, collection, treatment and discharge/disposition of the solid, liquid and airborne wastes from the development and

operation of mines handling radioactive ores (including the in situ leaching) and the operation of the ore mills and (2) the decommissioning of the mining and milling facilities. Emphasis should be given to siting, design, operational control, stabilization, environmental restoration and long-term surveillance of mill tailings impoundments and waste rock piles (including controlling their use as construction material).

The standard should primarily address the radiological hazard of the waste but should also give due consideration to its chemical hazards. The standard should also be applied to the storage and milling of other ores producing wastes containing radiologically significant amounts of uranium, thorium, and their decay products.

Standard 6. Decommissioning

In addition to complete decommissioning of facilities that handle radioactive material, the standard should address sealing and entombment. Decommissioning should also emphasize the need to design facilities for ease of decontamination and decommissioning. The standard covers decommissioning of all facilities except for mining and milling. Included are non-nuclear facilities for medicine, industry, and research, (including accelerators).

The scope of decommissioning should include exemption levels for release of materials for other uses whether recycled within the facility or used external to the originating facility.

The use of appropriate design and material choices for future decontamination and decommissioning would be included as part of the requirements to reduce the amount of radiation dose and the amount of waste resulting from discontinued operations.

3.2.2 Safety Guides

Standard No. 1, Establishing a National Radioactive Waste Management System should be accompanied by two guides:

- 1.1 Classification of Radioactive Waste
- 1.2 The Planning and Implementation of National Waste Management Programmes (to include infrastructure organizational and planning requirements and the means and methods for their implementation)

Standard No. 2, Pre-disposal Management of Radioactive Waste should have five guides:

- 2.1 Collection and Treatment of Low and Intermediate Level Waste at Nuclear Facilities (non alpha and non-high level wastes)
- 2.2 Collection and Treatment of Low and Intermediate Level Waste at Medical, Industrial and Research Institutions. (non- alpha and non-high level wastes)
- 2.3 Collection and Treatment at Facilities producing Spent Fuel, High Level and Alpha Waste
- 2.4 Conditioning and Storage of Low and Intermediate Level Waste (including storage of conditioned wastes)
- 2.5 Conditioning and Storage of Spent Fuel, High Level Waste and Alpha Waste (including storage of conditioned wastes).

Storage in Guides 2.4 and 2.5 would be that done before disposal in long-term centralized facilities. Storage of unconditioned waste is included in Guides 2.1, 2.2 and 2.3. Transportation would be by reference to other IAEA Safety Standards and Guides (eg. Safety Series No. 6, Regulations for the Safe Transport of Radioactive Material).

Standard No. 3, Near Surface Disposal of Radioactive Waste, should have three guides:

- 3.1 Siting of Near-surface Disposal Facilities
- 3.2 Design, Construction, Operation and Closure of Near-Surface Repositories
- 3.3 Safety Assessment and Institutional Controls for Near-Surface Disposal

Standard No. 4, Geologic Disposal of Radioactive Waste should have three guides:

- 4.1 Siting of Geologic Disposal Facilities
- 4.2 Design, Construction, Operation and Closure of Geologic Repositories
- 4.3 Safety Assessment for Geologic Disposal

Standard No. 5, Management of Wastes from Mining and Milling of Ores Containing Uranium and Thorium should have two guides:

- 5.1 Management of Waste from Mining and Milling Operations
[includes effluents]
- 5.2 Decommissioning of Uranium and Thorium Mines and Mills and Environmental Restoration for Mines and Mills, Waste Rock and Mill Tailings. [includes facilities decontamination, environmental restoration of the site, and disposition of the waste rock/soil and closure of the site]

Standard No. 6, Decommissioning of Facilities, should have two guides:

6.1 Decommissioning of Nuclear Power and Fuel Cycle Facilities.

6.2 Decommissioning of Medical, Industrial, and Research Facilities.
[The scope includes research reactors and accelerators etc.]

3.2.3 Format of Standards and Guides

Where appropriate the outline of the standards and guides should reflect six main topical areas: Administrative; Radiation protection; Siting, design and construction; Safety assessment; Operations; and Closure. The following is provided as a checklist for consideration in the preparation of documents. It is expected to be of value in ensuring completeness and a commonality of approach. However, it is recognized that these headings will not be relevant or appropriate for all of the documents to be developed in RADWASS.

Administrative

- planning
- organizing
- classifying into categories
- qualifying and training personnel
- records, funding, quality assurance and quality control, reporting
- safety reports, routine reporting
- regulations to be developed
- licensing procedures
- surveillance

Radiation Protection

- radiation protection requirements
- exemption levels
- effluent releases (by reference to other IAEA documents)

Siting, Design, and Construction

- site selection criteria
- design criteria
- material selection criteria
- waste minimization strategy

Safety Assessment

- model development and validation
- scenario identification
- consequence analysis

Operations

- operating criteria
- segregation of waste
- minimization of waste generation
- minimization of waste volumes
- recycle and reuse
- effluent controls
- characterization of waste
- mixed radioactive and hazardous waste
- monitoring
- emergency planning (unplanned events)
- security
- safeguards
- waste acceptance criteria
- packaging
- record keeping

Closure

- shut down
- site surveys/characterization
- decontamination (methodology, waste minimization and release levels)
- post-closure monitoring
- organizational responsibilities
- termination of operations
- records/archives

3.2.4 Other Possible Documents

A Standard on Environmental Restoration and Post Accident Waste Management is likely to be required in the future. Remediation is needed to deal with the results of accidents, pre-existing situations (old facilities and their environments). This need is likely to be accelerated as a result of changing regulations. Public demands to restore previously used areas for other uses will require environmental restoration. The evolution of this activity is not yet mature enough to warrant a standard at the present time.

A Standard on disposal at sea should not be included in the RADWASS plan at present given the current London Dumping Convention moratorium on sea disposal. Sufficient information has already been planned or developed by the Agency to fulfil its role in relation to the London Dumping Convention; however, the Agency should continue to keep the subject area under review.

The RADWASS plans developed in this document do not extend below the Safety Guide level. Later phases of RADWASS will, however, include Safety Practice documents and the framework established here will provide for their logical development under the Standards and Guides in particular subject areas.

4. RADWASS priorities

The current RADWASS programme envisages one Fundamental, six Standards and seventeen Guides. Given the limited Agency resources which can be applied to the task and the likely constraints on the availability of top quality experts from Member States it is necessary to develop priorities for document development.

Very High Priority

Principles for Radioactive Waste Management

High Priority Standards

- S 1. Establishing for a National Radioactive Waste Management System
- S 2. Pre-disposal Management of Radioactive Waste
- S 3. Near Surface Disposal of Short-Lived Radioactive Waste
- S 6. Decommissioning of facilities

High Priority Guides

- G 1.1. Classification of Radioactive Wastes
- G 2.2. Collection and Treatment of LILW at Medical, Industrial and Research Institutions
- G 3.1. Siting of Near Surface Disposal Facilities
- G 4.1. Siting of Geologic Disposal Facilities

The standard on "Geologic Disposal of Radioactive Waste", is not listed as a high priority document primarily because Safety Series No.99, "Safety Principles and Technical Criteria for the Underground Disposal of High Level Radioactive Wastes", has been recently issued (Nov.1989) and covers much the same area. It is considered that Safety Series No.99 can provide the higher level criteria to support Safety Guide 4.1.

All other documents are of medium priority. It should be noted that the priority listing reflects a compromise. It takes account of the pressing needs for Safety Series documents in the field of radioactive waste management by Member States on the one hand and the available resources for RADWASS on the other. The specific needs of Member States differ depending on the state and degree of maturity of its waste management programme. This has been factored into the priority listing developed above.

5. RADWASS and existing Safety Series Documents

Many of the existing Safety Series documents on radioactive waste management can be used as a basis for the planned RADWASS documents. This is particularly true for the Safety Series documents prepared within the Agency's underground disposal programme. The contents of these documents have, however, to be reorganized, reviewed and in some cases considerably expanded (eg. planning of waste management systems, uranium mining and milling) in order to fit into the RADWASS scheme.

Certain Safety Series documents, planned before the RADWASS programme started, are currently being prepared within the Waste Management Section. Consideration has been given as to how they match with the RADWASS programme. Two planned Safety Guides in the Underground Disposal area will be modified so as to become Safety Guides 4.2 and 4.3, a third will be published in the informal TECDOC series and used as a source document for Guides 4.1 and 4.2. Two Safety Practices documents and a Safety Guide on the application of exemption principles to radioactive waste disposal will be published under Standards 1, 2 and 6; a third Safety Practices document will be issued in respect of IAEA's role under the London Dumping Convention (outside RADWASS). Finally two documents, which are already completed, will be published as Safety Guides prior to the establishment of RADWASS. These plans are summarized in Annex 2.

6. Implementation and management of RADWASS

Management

The RADWASS management scheme is set out in Annex 3.

The objectives, scope, and contents of each RADWASS document will be established by the Secretariat and approved by INWAC prior to the development of the document. Draft documents will be reviewed by specialist Technical Committees covering the following areas:

- 1) Planning and Regulations
- 2) Pre-disposal (Collection, Handling, Processing, Storage)
- 3) Disposal
- 4) Mining and Milling Wastes
- 5) Decommissioning

These will be standing committees containing eight to ten experts in each of these subject areas nominated by Member States in consultation with the Secretariat. In the case of the Safety Fundamentals, the Technical Committee will be a sub-group of INWAC. The Technical Committee may approve documents for the next stage of review or return the documents to the Consultants Group for revision. Safety Fundamentals and Standards will be reviewed and approved by INWAC.

All RADWASS documents will be reviewed and approved by the Safety Series Review Committee (SSRC) before publication. However, SSRC will be consulted at an earlier stage to get initial comments at a time when changes can be more easily accommodated.

Following approval by INWAC, Fundamentals and Standards will be reviewed and approved by Member States (by correspondence) by the SSRC and by the Agency's Board of Governors before final approval for publication. This rather elaborate approval procedure is considered to be necessary for documents at the Fundamentals and Standards level since these documents establish basic principles and requirements for safety and they must be shown to have achieved international consensus at the highest level. Documents at the Guide and Practice level do not normally require the same degree of review and approval since they are documents which recommend approaches, procedures, and methods for complying with the Standards. It will usually be sufficient for them to be approved by the standing Technical Committee, the SSRC and the Publications Committee.

Implementation

The consultants recommended that the 24 document programme should be completed in six years, with the 10 high-priority documents identified in Section 4 being completed by 1994. The Secretariat's proposal which takes account of available staff capacity and of the impact on Member States, envisages the completion of 9 high-priority documents by 1994. Annex 4, RADWASS Operation - Phase I (1991-1994) sets out the programme for production of documents during Phase I of RADWASS. This is based on the availability of the RADWASS manager to the Secretariat by January 1991 and one additional RADWASS post available by January 1992. It depicts the number of consultant meetings, Technical Committee meetings, and reviews by INWAC, SSRC, Member States, and the Board of Governors, that will be required through 1994. It is envisaged that a formal review of the programme will be undertaken in 1993 to define document production rates and resources needed for the post 1994 period (Phase II), after some experience has been gained in the programme.

Numbering

The RADWASS numbering scheme will be a simplified version of the NUSS document series. There will be a RADWASS identifying number XXX, followed by a letter designating the document category F, S, G, P followed by a sequential number in each category for that particular document. For example:

Safety Fundamental, Safety Series No. XXX-F1.

Safety Standard, Safety Series No. XXX-S1

RADWASS Document Plan

WASTE MANAGEMENT FUNDAMENTAL - "Principles for Radioactive Waste Management"

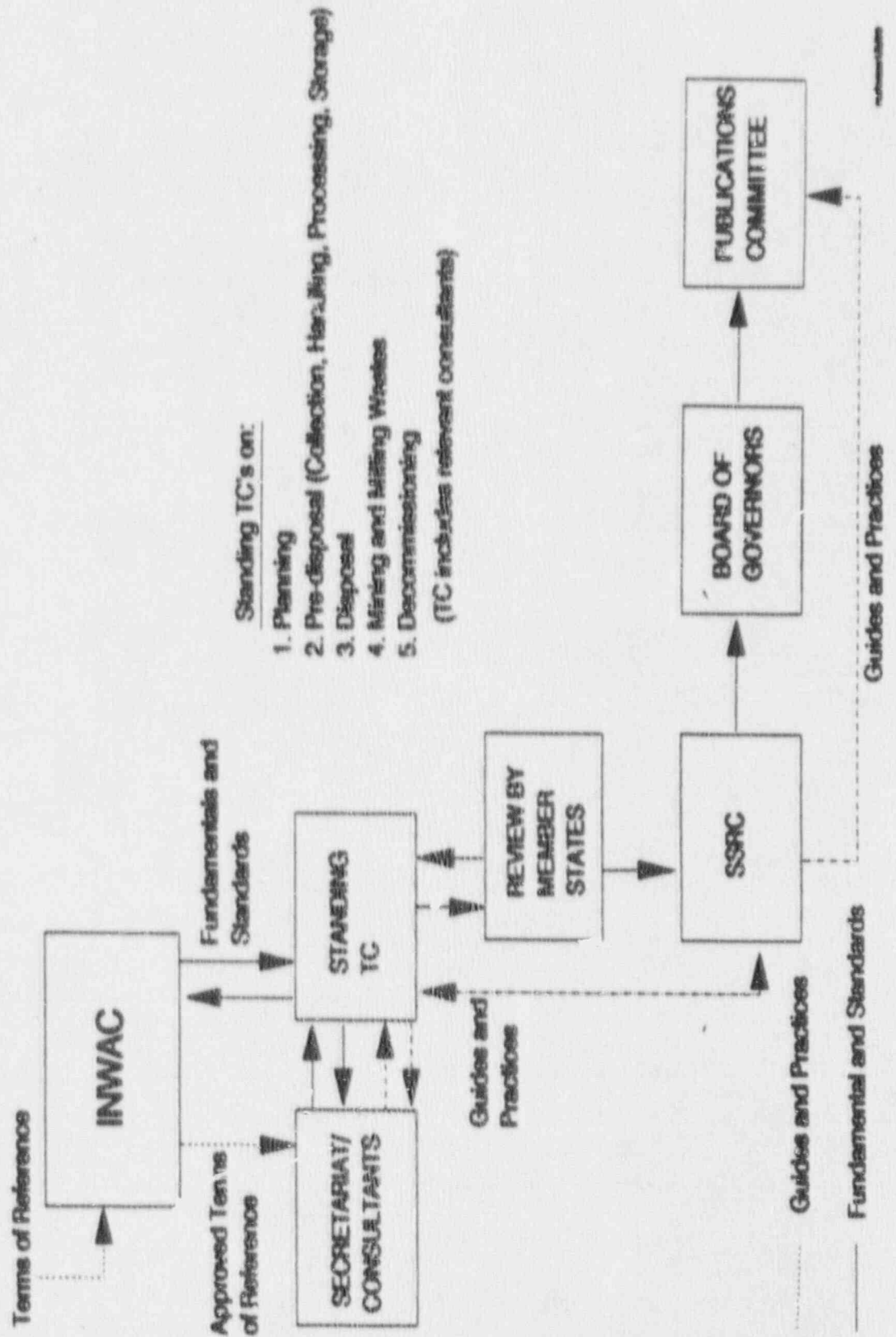
Subject Areas	Planning	Pre-Disposal	Disposal		Uranium and Thorium Waste Management	Decommissioning
	1	2	3	4	5	6
S T A M D A S D S	Establishing a national radioactive waste management system	Pre-disposal management of radioactive waste	Near-surface disposal of radioactive wastes	Geologic disposal of radioactive wastes	Management of wastes from mining and milling of ores containing uranium and thorium	Decommissioning of facilities
	1.1	2.1	3.1	4.1	5.1	6.1
	Classification of radioactive wastes	Collection and treatment of LILW at nuclear facilities	Siting of Near-surface Disposal Facilities	Siting of Geologic Disposal Facilities	Management of wastes from mining and milling operations	Decommissioning of nuclear facilities
G U I D E S	1.2	2.2	3.2	4.2	5.2	6.2
	The Planning and implementation of National Waste Management Programmes	Collection and treatment of LILW at medical, industrial and research institutions	Design, Construction Operation and Closure of Near Surface Repository	Design, Construction Operation and Closure of Geologic Repositories	Decommissioning of U and Th mills and environmental restoration of waste rock and mill tailings	Decommissioning of Medical, Industrial and Research Facilities
		2.3	3.3	4.3		
		Collection and treatment of radioactive waste at facilities producing SF, HLW and alpha waste	Safety Assessment and Institutional Controls for Near-surface Disposal	Safety Assessment of Geologic Disposal		
		2.4				
		Conditioning and storage of LILW				
		2.5				
		Conditioning and storage of SF, HLW, alpha				

1
2
3
4

Plans for Safety Series Document Currently under Production in
Waste Management Section in regard to RADWASS

<u>Category originally planned</u>	<u>Title</u>	<u>Responsible Officer</u>	<u>Status</u>	<u>Recommended Action</u>
1. Safety Guide	The Regulatory Process in the Decommissioning of Nuclear Facilities	De	Approved for Publication	Publish as approved by SSRC with remarks in Foreword.
2. Safety Guide	Design and Operation of Radioactive Waste Incineration Facilities	Efremenkov	with SSRC	Same as No.1
3. Safety Guide	Operation, Shutdown and Closing of Deep Geological Repositories	Bell	Completion 1992	Expand to become RADWASS Guide 4.2
4. Safety Guide	Performance and Safety Assessment of Radioactive Waste Repositories	Bell	Completion 1992	Should become RADWASS 4.3
5. Safety Guide	Siting, Design and Construction of a Deep Geological Repository for Disposal of High- level and Alpha-Bearing Wastes	Squires	Completion 1990	Publish as TECDOC and use it as source for Guides 4.1- 4.2
6. Safety Practices	on Application of Exemption Principles to the Recycle and Reuse of materials from the Nuclear Fuel Cycle	Linsley	Completion 1990	Publish as a Safety Practice under Standard in area 1.
7. Safety Practices	on Application of Exemption Principles to Wastes Arising from Radioisotope uses in Hospitals and Research Establishments	Linsley	Completion 1991	Publish as Safety Practice under Standard in Area 1.
8. Safety Practices	on Application of Exemption Principles to the Marine Disposal of Radioactive Wastes	Calmet	Completion 1993	Continue as planned as activity exercise in the IAEA role under the London Dumping Convention.
9. Safety Guide	on Criteria for Unrestricted Release of Materials, Facility or Site from	De	Completion 1992	Guide or Practice under Standard in Area 6

Process for Production, Review and Approval of RADWASS Documents



ANNEX 4

RADWASS Operation - Phase 1 (1991-1994)

Key to Chart:

- CM - Consultants Meeting
- TC - Technical Committee Meeting
- INWAC - Review by International Radioactive Waste Management
Advisory Committee
- SSRC - Review by Safety Series Review Committee
- MS - Review by Member States
- BG - Review by Board of Governors
- PC - Review by Publications Committee

ANNEX 4

RADWASS Operation - Phase I (1991-1994)

RADWASS DOCUMENT	1990	1991	1992	1993	1994
FUNDAMENTAL - PRINCIPLES OF RADIOACTIVE WASTE MANAGEMENT		CH TC	CH TC	MS CH	BG PC
SS No.1 - PLANNING FOR NATIONAL WASTE MANAGEMENT SYSTEMS		INWAC	SSRC INWAC	SSRC	BG PC
SG No.1.1 - CLASSIFICATION OF RADIOACTIVE WASTES	CH TC	CH TC	INWAC PC	SSRC INWAC	SSRC
SS No.2 - PRE-DISPOSAL MANAGEMENT OF RADIOACTIVE WASTES		CH TC	SSRC CH TC	MS CH	BG PC
SG No.2.1 - COLLECTION AND TREATMENT OF LILW AT MEDICAL, INDUSTRIAL AND RESEARCH INSTITUTIONS			INWAC SSRC	INWAC	SSRC
SS No.3 - NEAR SURFACE DISPOSAL OF RADIOACTIVE WASTES	CH TC	CH TC	CH TC	MS CH	BG PC
SG No.3.1 - SITING OF NEAR SURFACE DISPOSAL FACILITIES		TC	INWAC CH SSRC PC	INWAC SSRC	
SG No.4.1 - SITING OF GEOLOGICAL DISPOSAL FACILITIES	CH	TC	CH PC		
SS No.6 - DECOMMISSIONING OF FACILITIES		CH TC	CH	TC MS	CH BG PC
			INWAC	SSRC INWAC	SSRC

ENCLOSURE B

DEC 10 1990

Mr. Carl R. Cooley
Acting Director
Division of Demonstration, Testing
and Evaluation
Office of Technology Development
U.S. Department of Energy
Washington, DC 20585

Dear Mr. Cooley:

This is a preliminary response to your October 19 letter to me in which you asked for NRC input and comment on the IAEA Radioactive Waste Safety Standards (RADWASS) Program.

The RADWASS Program is an ambitious, long-term effort which could require a considerable level of NRC resources if our agency were to decide to support and participate in this program in a meaningful way, including active participation in drafting and technical review meetings in Vienna. In light of this and the NRC's present resource constraints, the staff has decided to consult with the Commission in this matter to obtain Commission guidance on the nature and extent of NRC involvement in RADWASS. We will advise you of the Commission's decision.

Sincerely,

Original signed by
James R. Shea

James R. Shea, Director
International Programs
Office of Governmental and
Public Affairs

ENCLOSURE C

DRAFT
GPA/IP
12/14/90

Mr. Carl R. Cooley
Acting Director
Division of Demonstration, Testing and Evaluation
Office of Technology Development
U.S. Department of Energy
Washington, D.C. 20585

Dear Mr. Cooley:

As a follow up to my letter of December 10, this is to inform you that the Commission has reviewed the question of NRC involvement in the IAEA RADWASS Program. In performing the review, the Commission has taken into account current and projected staff work loads, present levels of effort devoted to international activities, including NRC participation in ongoing IAEA programs, and considered the availability of knowledgeable staff who could be called upon to participate in a new, long-term IAEA program.

The Commission has concluded that the RADWASS Program appears to be a well-thought-out and potentially useful effort for assembling and integrating nuclear waste information developed by IAEA member countries. However, current NRC work loads and staff constraints will allow us to provide only limited, periodic assistance to this effort.

Such assistance could include, for instance, making relevant NRC documents and staff position papers available to the RADWASS Program, offering to meet from time to time with RADWASS Program participants visiting the U.S., having NRC staff members visiting Vienna on other IAEA business hold discussions with RADWASS Program participants, and reviewing draft documents which fall clearly with the NRC's purview. We are, however, unable at this time to commit to participating regularly in RADWASS technical committees or in the preparation of RADWASS technical documents. At this point we also have no further comments to make on the RADWASS Program document.

We hope to keep informed in a general way on the progress of this Program through our contacts with Dr. Michael Bell of the IAEA (previously an NRC staff member) and would also appreciate receiving from you periodic information on key RADWASS developments and milestones.

Sincerely,

James R. Shea, Director
International Programs
Office of Governmental and
Public Affairs