

were drawn from 23 countries. The panel's work was facilitated by the experience of the earlier group dealing with liability. It also had before it the conclusions of a September 1959 meeting of the International Maritime Committee at Rijeka, Yugoslavia, where the problem of liability for nuclear ships was considered in some detail.

The experts concluded that the problems of nuclear ship hazards called for quick action on an international basis. It was noted that two nuclear ships for peaceful purposes had already been built and others were planned, any of which could be involved in collisions or make visits to any coast or port.

It was decided that the panel should attempt to define the principal legal issues arising in connection with liability for nuclear-powered ships, and to formulate generic recommendations based on the personal views of the experts.

A majority of the panel reached conclusions similar to those of the earlier panel on civil liability with regard to absolute liability; concentration of liability in the operator; the need to limit liability in amount and time; and the need for adequate insurance or other financial coverage. As to jurisdiction, the majority felt that it should lie exclusively with courts of the State on the territory of which a nuclear incident oc-

curred, with the State which licensed the vessel to have jurisdiction in certain special cases, such as when the incident occurred on the high seas. Recommendations were made as well on a variety of other detailed legal questions which would have to be considered in drafting any international convention on this subject.

A report reflecting the panel's conclusions as well as divergencies of views was submitted to the Director General in September 1960. With the approval of the Board of Governors, the Director General presented this report in November 1960 as a working document for the Diplomatic Conference on Maritime Law scheduled to be held in Brussels in April 1961. The Agency is co-sponsoring the item on the agenda of this Conference relating to the liability for operations of nuclear ships.

* * * * *

The Agency's regulatory work has proved even more important than was originally expected. It is clear that these activities must be continued for several years, as there are several fields not yet covered, and several which must be followed through by incorporation into international conventions or other administrative frameworks.

EFFECTS OF RADIOACTIVITY IN THE SEA

Increasing applications of atomic energy have focused attention on the problem of possible pollution of the sea by the deposition of radioactive materials. One of the obvious hazards is return of the radioactivity to man through marine products. The importance of adequate research into this problem is now widely recognized, and the first United Nations Conference on the Law of the Sea adopted a resolution saying that

"the IAEA, in consultation with existing groups and established organs having acknowledged competence in the field of radiological protection should pursue whatever studies and take whatever action is necessary to assist States in controlling the discharges or release of radioactive materials to the sea, promulgating standards, and in drawing up internationally acceptable regulations to prevent pollution of the sea by radioactive material in amounts which would adversely affect man and his marine resources."

Scientific knowledge about the redistribution of materials in the oceans, particularly in the biological cycles, is very limited at present, but it is possible to study this process with the help of radioactive substances used as tracers. A program of

research in this field is to be conducted under a trilateral agreement between the International Atomic Energy Agency, the Government of the Principality of Monaco and the Institute of Oceanography in Monaco. The program will have three major objectives. Firstly, it will be aimed at acquiring knowledge about the movement of water and marine organisms and the deposition of organic and inorganic matter. Secondly, there will be a special study of the distribution in marine organisms of radioactive materials already existing or that may be introduced into various locations. And thirdly, there will be a study of the effects of radioactive materials at various concentration levels on the marine ecology.

In studying the effects of radioactive materials on the marine ecology care will be taken to see that the necessary experiments do not contaminate edible fish in the sea. Preliminary experiments in tanks or laboratory vessels can determine the concentration levels below which the materials do not produce any observable effects on marine organisms, and in subsequent experiments in the sea to determine the distribution and redistribution of materials the radioactive substances to be used as tracers can be chosen accordingly. Because of the extreme sensitivity with which radioactive materials can be detected, the redistribution can be studied with amounts too small to have any observable effects on the biological systems.



The agreement for research being signed at IAEA headquarters by Mr. Emile Pelletier, Minister of State of the Principality of Monaco, (left), and Mr. Sterling Cole, Director General, IAEA, (right). In the center is Mr. A.D. McKnight, chairman of the IAEA Board of Governors

It can be expected that certain chemical elements will be found to undergo abnormal redistributions in the sea; for example some may be concentrated while others may be excluded by marine life. When such effects have been identified, the research is likely to narrow towards studying these particular elements in detail. In the beginning, however, the materials will be selected on the basis of their availability, radioactive life and detectability. As regards detectability, it will also be necessary to establish by experiment the background levels of radioactivity from the natural elements and from the artificial radioactive materials already present in the sea.

The research will be conducted at the Scientific Center of the Government of Monaco; the laboratory and working facilities of the center will be made available for the research project. A wide variety of electronic and monitoring equipment will also be available. The Oceanographic Institute, on its part, will put at the disposal of the project a number of valuable facilities, including marine biology laboratories, an oceanographic vessel and a boat, as well as some specialized fishing equipment. Certain other facilities, including a 360-ton oceanographic ship, may also be procured through the Institute.

The Monaco Government will this year make a voluntary contribution of 200 000 French NF to the Agency's General Fund, to be used to cover expenses in connection with the research project. It has also agreed to contribute the same amount for each subsequent year of the project.

The Agency will appoint a chief scientist to be in charge of the conduct of research and provide the necessary personnel for the project. In agreement with the Agency, personnel may also be provided by the Monaco Government and the Oceanographic Institute. The Agency will put at the disposal of the project any additional specialized equipment that may be necessary for the project, and will provide scientific and technical supplies of up to \$10 000 in value.

It has been agreed that all results of the research project, including any inventions or discoveries, will be made available for the development and practical application of atomic energy for peaceful purposes throughout the world. To that end, steps will be taken to ensure that the results are promptly and extensively published.