

ASSESSMENT OF RADIONUCLIDE MIGRATION IN THE BALTIC SEA (LIT/2/002) F1

New

MODEL PROJECT

CORE FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL
	m/d	US \$	US \$	US \$	m/d	US \$	m/d	US \$	US \$	US \$	US \$	US \$
1999	0/21	10,290	0	82,000	4/0	13,800	1/7	13,320	0	0	0	119,410
2000	2/15	38,625	0	40,000	3/0	10,800	1/0	11,400	0	0	0	100,825

First Year Approved: 1999

OBJECTIVES: To create a model for estimating radionuclide migration and self-cleaning processes in the Lithuanian part of the Baltic Sea, supported by site monitoring.

BACKGROUND: During the Chernobyl accident, Baltic Sea contamination was caused by atmospheric deposition and by river and overland runoff. After Chernobyl, the levels of anthropogenic radionuclides increased considerably. Although Cs-137 concentration has decreased by about half since 1986, it is still high in comparison with other shelf seas (120 Bq/m³). From time to time, an increase in Cs-137 concentration of up to 200 Bq/m³ is registered. Thus, more than a decade later, the Baltic Sea is the most contaminated marine environment. At present, further contamination is occurring due to migration of radionuclides from contaminated regions by air resuspension and forest fires. In addition to the pollution assessment interest due to the harmful effects of radionuclides on environmental and human health, nuclear techniques can provide unique information required for assessing the

radionuclide migration. An unexpected increase in Cs-137 concentration requires additional efforts in the estimation of the radionuclide changes in the region. There are a number of State scientific research programmes, such as "Ecology sustainability of Lithuania" and "The Baltic Sea", to which the project will make an important contribution.

PROJECT PLAN: During its first phase, the project will assess the needs for training, expertise and equipment. In parallel, migration of radionuclides, their deposition to the sediments, resuspension, sorption desorption, bioaccumulation and selfcleaning processes will be investigated, by surface and deep water sampling and collection of bottom sediments. Daily, monthly and seasonal samples of atmospheric aerosols and deposition together with alpha, beta and gamma measurements will be carried out at stations in Vilnius (continental) and Preila (seashore) in different areas of the Lithuanian Baltic Sea. In the second phase, mathematical modeling methods will be used to improve dose rate calculations. The third phase will strengthen the capacities created, complete the environmental assessment and issue recommendations and guidelines for future activities to the Ministries of Environmental Protection and Health. A cruise is envisaged to be organized in the Baltic Sea to complete the assessment programme and the analytical work of collected samples.

NATIONAL COMMITMENT: Laboratories, equipment and staff of the Vinius Gediminas Technical University, Institute of Physics, Institute of Geography and Radiation Protection Centre. The Institute of Physics will be responsible for aerosol, deposition, water and bottom sediment sampling, radiochemical separation, and speciation of radionuclides. Vilnius Gediminas Technical University will be responsible for sea water sampling for radiochemical separation and CS-137 and Sr-90 measurements; the Institute of Geography for sampling, and hydrochemical, mineralogical and sedimentation parameter evaluation. The Radiation Protection Centre will be responsible for dose calculations.

AGENCY INPUT: Expert advice and training of local staff in radionuclide migration in marine environment, and the use of migration models; spectrometric system. Organization and co-ordination of a cruise on the Baltic Sea and organization of any technical meetings required.

PROJECT IMPACT: Evaluation of radionuclide migration and prognostic models for normal and accident conditions will enable the improvement of safety in the Baltic Sea environment. The enhanced capabilities are necessary for carrying out ongoing national and international programmes. Tourism prospects will improve and social tension will decrease in the Baltic communities. The project will provide reliable information and data to create a reliable basis for Baltic Sea environmental management decisions by the Government, increasing health safety in the region. The project is consistent with and makes a significant contribution to the UN Global Programme of Action for the protection of the Marine Environment.