



DEPARTMENT OF RESEARCH AND ISOTOPES

INTERNATIONAL ATOMIC ENERGY AGENCY

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In order to put the problem of Core Conversion into perspective, statistical information on research reactors on a global scale is presented. Following this, Agency Activities will be described.

INTERNATIONAL ATOMIC ENERGY AGENCY

RESEARCH REACTOR DATA BASE

-RRDB-

HEADER INFORMATION

IDENTIFICATION
STATUS
CATEGORY
INFORMATION DATE
REGULATORY

FUEL DATA

CRITICAL MASS
NORMAL CORE
ENRICHMENT
FUEL ELEMENT DATA
BURNUP
SPENT FUEL STORAGE AND SHIPMENT
CORE CONVERSION DATE

GENERAL INFORMATION

FACILITY NAME
ADMINISTRATOR
ADDRESS, TELEPHONE, TELEX
OWNER
OPERATOR
DATES - CRITICALITY, ETC.
SAFEGUARDS
COST
STAFFING

UTILIZATION DATA

OPERATING SCHEDULE
UTILIZATION PROGRAM

TECHNICAL DATA

TYPE
POWER
FLUX
MODERATOR, COOLANT, REFLECTOR
MODIFICATIONS

THIS INFORMATION IS AVAILABLE TO ALL
MEMBER STATES

EXPERIMENTAL FACILITIES

NUMBER
TYPE
FLUX
USE

OPERATING RESEARCH REACTORS

DISTRIBUTION BY POWER

	<u>0-1 KW</u>	<u>1-100 KW</u>	<u>0.1-1MW</u>	<u>1-5 MW</u>	<u>5-10 MW</u>	<u>10-20 MW</u>	<u>> 20 MW</u>
<u>WORLD WIDE (333)</u>	27 %	19%	15%	16%	6%	2%	15%
<u>USA (112)</u>	29%	18%	21%	13%	3%	0	10%
<u>DEVELOPING COUNTRIES (68)</u>	21%	13%	19%	28%	6%	4%	9%

OPERATING RESEARCH REACTORS

WITH HEU FUEL

TOTAL

NUMBER OF REACTORS	155
NUMBER OF COUNTRIES	41

DEVELOPING COUNTRIES

NUMBER OF COUNTRIES	26
NUMBER OF REACTORS	35

POWER GREATER THAN 5 MW= 16

POWER GREATER THAN 1 MW= 21

ABOVE DATA DOES NOT INCLUDE TAIWAN OR USSR

TOTAL NUMBER OF REACTORS - HEU AND LEU	333
TOTAL NUMBER OF MEMBER STATES	54

DISTRIBUTION OF OPERATING REACTORS

USING HEU

	<u>TOTAL</u>	<u>DEVELOPING COUNTRIES</u>
0 - 500 KW	76	13
0.5 MW - 1.0 MW	9	2
1 MW - 5 MW	31	11
5 - 10 MW	14	5
GREATER THAN 10 MW	25	4
TOTAL	155	35

DOES NOT INCLUDE USSR

DOES NOT INCLUDE 7 COMECON AND USSR MANUFACTURED REACTORS

The rest of this paper describes the Research Reactor Core Conversion Programmes of the Department of Research and Isotopes. Primary responsibility for this area of research reactors rests with the Physics Section of the Department. Ongoing programmes and some future activities are briefly described along with past activities to illustrate the types of programmes that are normally conducted.

Technical Committee Meetings on the subject of Research Reactor Core Conversion to Low Enrichment Uranium Fuels have been held in Vienna since 1978. The results of these meetings have been the following publications:

TECDOC-233 - Research Reactor Core Conversion from the Use of Highly Enriched Uranium to the use of Low Enriched Uranium Fuels, Guidebook, 1980.

TECDOC-324 - Research Reactor Core Conversion from the Use of Highly Enriched Uranium to the Use of Low enriched Uranium Fuels, Guidebook Addendum: Heavy Water Moderated Reactors, 1985.

TECDOC-304 - Core Instrumentation and Pre-Operational Procedures for Core Conversion, 1984.

Additional publications are in preparation:

Guidebook on Safety and Licensing Issues Related to Core Conversion - Summary plus four volumes. One of the Volumes will address Physical Properties and Irradiation Behaviour of LEU Fuels - expected date, 1985-1986.

Analysis Summary - Volume 1
Analytical Verification - Volume 2
Fuel - Volume 3
Operations - Volume 4

Missions

Several missions of experts have visited countries to discuss and help to plan Core Conversion programmes. To date, twelve countries have been visited.

Training Courses

Training Course on Conversion of Research Reactors to LEU Fuels was held in Caracas, Venezuela, in 1985. The Course was of four weeks duration. Twenty participants from sixteen countries attended the course. A repetition of this course or a modified one is planned.

Fellowships

To date there have been seven fellowships on the subject. Average duration is 6 months.

International RERTR Meetings

The Agency has supported attendance to these meetings of participants from developing countries. Normally, six to eight participants are supported each year.

Seminars

The Agency conducts Seminars on various aspects of research reactors every one to two years. During these Seminars, part of the Agenda is devoted to RERTR-Core Conversion topics.

Recent Seminars were held in:

Jülich	1981
Kuala Lumpur	1983
Copenhagen	1985

Future Activities

Publications as determined to be necessary will be produced by Agency-sponsored experts.

Training will receive increased emphasis in the form of Courses and fellowships.

Missions and expert services will be provided as required.

Equipment as needed on an individual basis will be provided.