



# INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY

A/CONF.8/P/4  
CANADA  
30 June 1955

ORIGINAL: ENGLISH

Confidential until official release during Conference

## SOME ECONOMIC ASPECTS OF NUCLEAR FUEL CYCLES

by

W. B. Lewis

### Contents

	<u>Page</u>
1. <u>Introduction</u> Range of costs and burn-up required.	2
2. <u>Fuel Fabrication and Reprocessing Costs</u> Cost allowance for reprocessing related to fuel irradiation cycle.	3
3. <u>Fuel Inventory Charges and Make-up Supply</u> Cost allowance for fuel inventory and make-up supply related to average power rating and "burn-up factor".	4
4. <u>Prolonged Irradiation of Natural Uranium</u> Contributions from U-235, Pu-239, Pu-241 and fast fission in U-238.	6
5. <u>Long Irradiation of U-235 Enriched Uranium</u> Fuel regeneration factor and processing and make-up costs.	9
6. <u>Plutonium as a Recycled Fuel in Thermal Neutron Reactors</u> Changes of neutron yield, Growth and disposal of Pu-242.	10
7. <u>Recycling with Natural Uranium Make-up</u> A special cycle for 3% burn-up. Cost relations for this and other fuel cycles.	11
8. <u>The Fuel Regeneration Factor</u> The importance of the fast fission factor. The overall, initial and local fuel regeneration factors.	14
9. <u>Reactivity Requirements</u> Excess cross-section. Redistribution of fuel within the reactor.	16
10. <u>The Cost of Neutron Absorbers</u> The cost of wasted neutrons. Sheathing losses. Comparison of costs between light water and heavy water.	17

西平力談話會