

Mastering Nuclear Fuel Markets:

MODULE No. 4

NUCLEAR FUEL CYCLE ECONOMICS

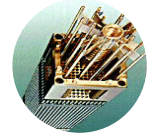
Calculating and evaluating fuel cycle costs consists of much more than simply adding up the purchase prices of the U_3O_8 , conversion services, enrichment services and fabrication services paid for a reload batch. Consideration must also be given to the schedule of payments and the interest costs associated with the fuel both during the manufacturing process and during the irradiation period. Attention must be paid to the costs of spent fuel management, whether the spent fuel will be maintained in the spent fuel pool, placed in on-site dry storage or shipped off-site for reprocessing or final disposal.

Special consideration must be given when comparing the fuel cycle costs of two or more alternatives to ensure a fair and equitable comparison. This includes such activities as evaluating competitive bids, assessing new vs. older fuel designs, exploring different cycle lengths, etc.

This module addresses the basic principles of nuclear fuel cycle economics and the basic fuel cycle economics model. It describes the methods employed to perform fuel cycle cost calculations, the inputs required and the interpretation of the results. Special emphasis is placed on comparing alternative fuel cycles.

The objectives for the Nuclear Fuel Cycle Economics Module are as follows, but the training sessions may be customized to meet your specific needs. This module can be conducted in less than one day.

- ◆ Describe and Discuss the Basic Principles of Nuclear Fuel Cycle Economics
 - The fuel cycle economic model
 - Investment in fuel cycle commodities and services
 - Interest (carrying) costs
 - Amortization and depreciation
 - Escalation
 - Present worth
- ◆ Describe and Discuss the Principal Considerations in Performing Fuel Cycle Cost Calculations
 - Making fair and equitable comparisons of alternatives
 - Consistency of alternative fuel cycles – energy production, margins to operating limits, etc.
 - Impact of different fuel assembly designs
 - Impact of varying cycle length – replacement power considerations
 - Base scope of supply – services included in the base prices
 - Optional services and equipment
 - Spent fuel management costs
 - Costs of transition between suppliers, if applicable
 - Special considerations in international procurement



MNFM 4: NUCLEAR FUEL CYCLE ECONOMICS—PAGE 2

- ◆ Describe and Discuss the Inputs to the Fuel Cycle Cost Analyses
 - Sources of data – internal and external
 - Fuel cycle plan - cycle energy production
 - Unit costs for U_3O_8 , conversion, enrichment, fabrication and spent fuel management
 - Escalation provisions, interest rates, present worth factors
 - Lead times and payment schedules
- ◆ Describe and Discuss Evaluating the Results of the Analyses
 - Presenting the results
 - Direct costs and interest costs
 - Individual component costs (U_3O_8 , conversion, enrichment, fabrication, spent fuel management)
 - Present worth of the results
 - Equalizing the scope of supply among alternatives
 - Sensitivity studies
 - Performing fair and equitable comparisons of alternatives
 - Selecting the preferred alternative – figure of merit to be employed