

ATW Total Life-Cycle Cost Estimate Status

Richard I. Smith

**Pacific Northwest National
Laboratory**

May 6, 1999

Why develop a TSLCC?

- **Provide estimate of ATW implementation cost**
- **Provide estimate of annual funding requirements**
- **Provide estimate of net program cost in terms of mils/kWh**

Postulated system being estimated

- **Multiple phases: R&D, Demonstration, Deployment**
- **Deployed system: 1 (or 2) LWR processing plants, 7 burner stations**
- **Each burner station contains eight 1000 MWt burners arranged in blocks of two burners and one turbine-generator set, two accelerators in parallel to drive the burners, and one ATW fuel fabrication and recycle plant.**

Estimating Methodology

- **Use well-developed existing estimates as bases**
- **Adjust the selected base for addition or deletion of functions**
- **Scale the selected base to reflect planned throughput**
- **Escalate the adjusted base to 1999 \$ using BLS data**
- **Use FOAK and NOAK estimates for 1st and 2nd, apply learning curves to rest**

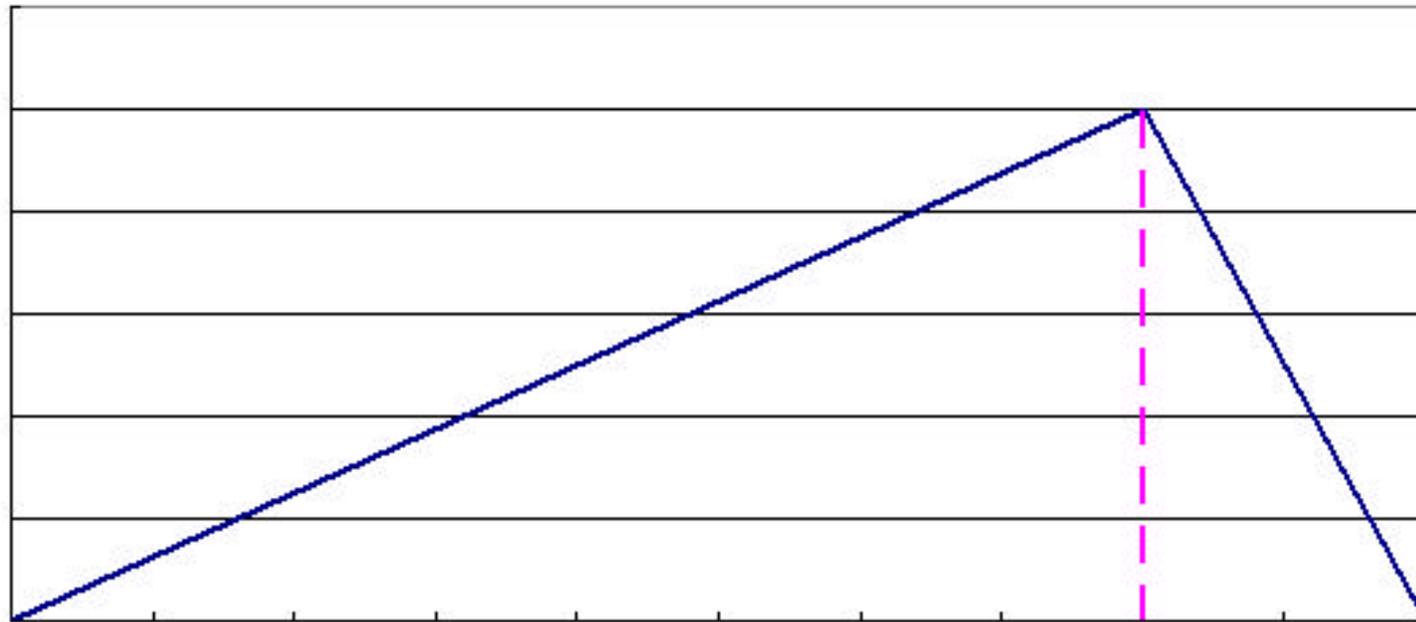
The Reference Facilities Used as Base

- **LWR Processing Plant: ALMR Stand-Alone Processing Facility**
- **Accelerator: APT CDR**
- **ATW Burner and Elect. Gen: ALMR Mod B 2-Reactor Block and T/G set**
- **ATW Fuel Fab and Recycle Plant: ALMR Central Fuel Facility**
- **Retrieval, Transport, and Disposal Function: OCRWM TSLCC**

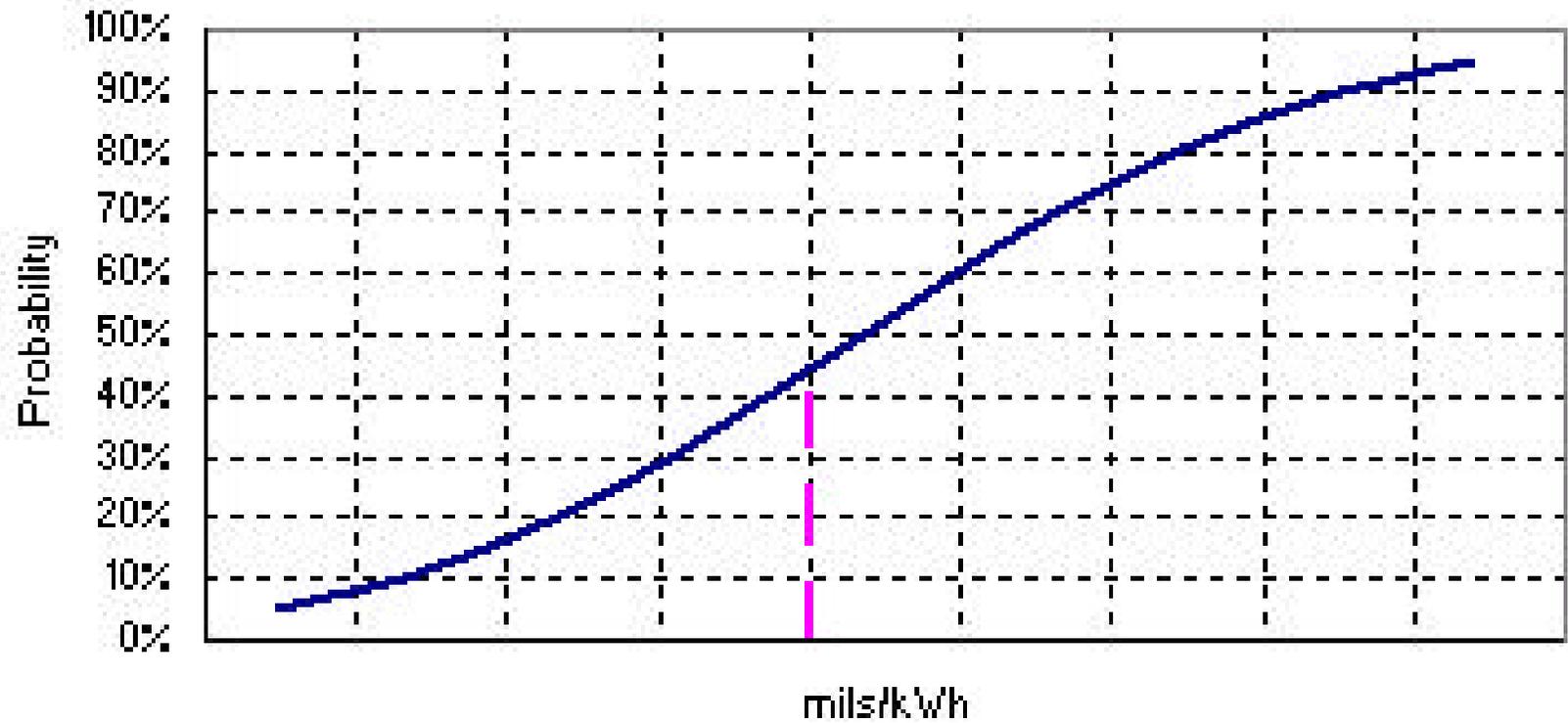
Cost Uncertainty Analyses

- **Triangular Distribution about the estimate point, for each major component of the estimate (capital facilities, operations, transport functions, D&D)**
- **Perform Monte Carlo analysis on each major component distribution and combine for total system cost range**
- **Provides probability of cost being greater than or less than the estimate**

Triangular Distribution of Estimates



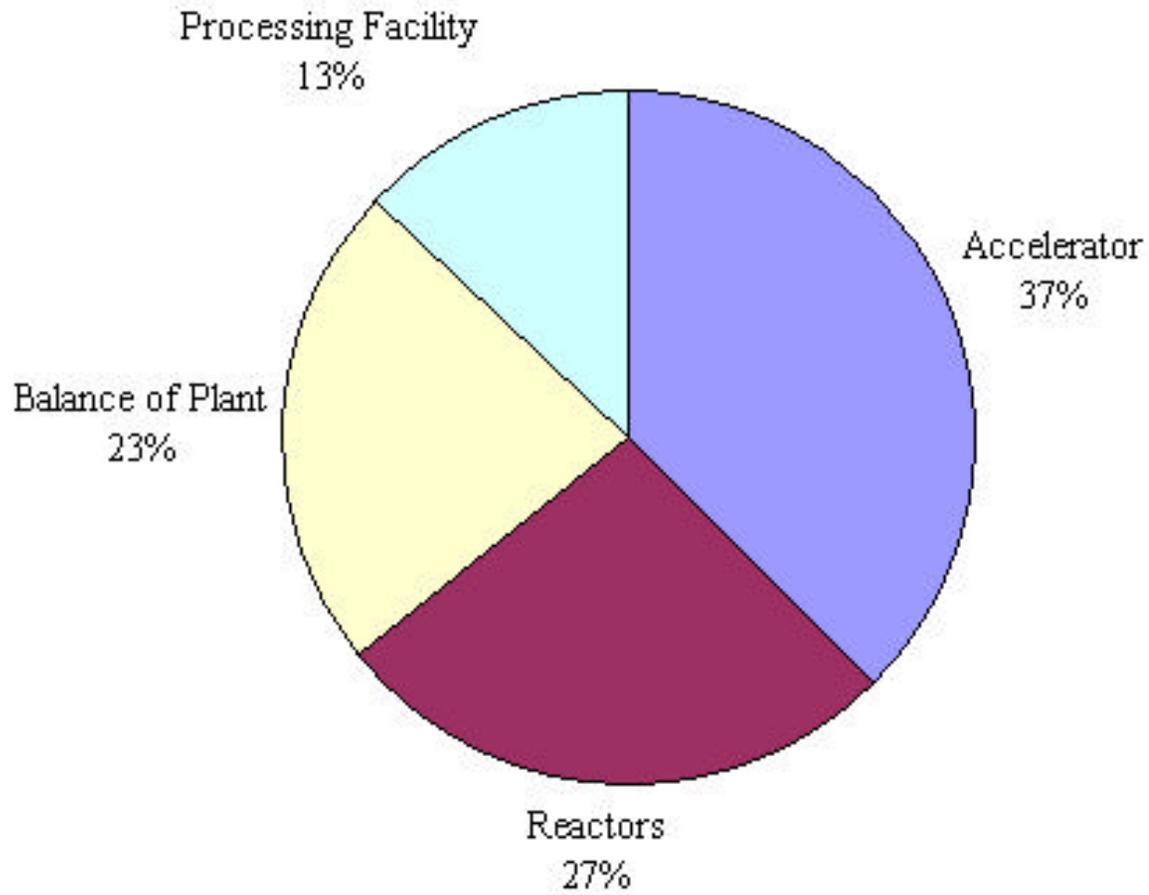
Probability of Delivering ATW at or Below Estimate



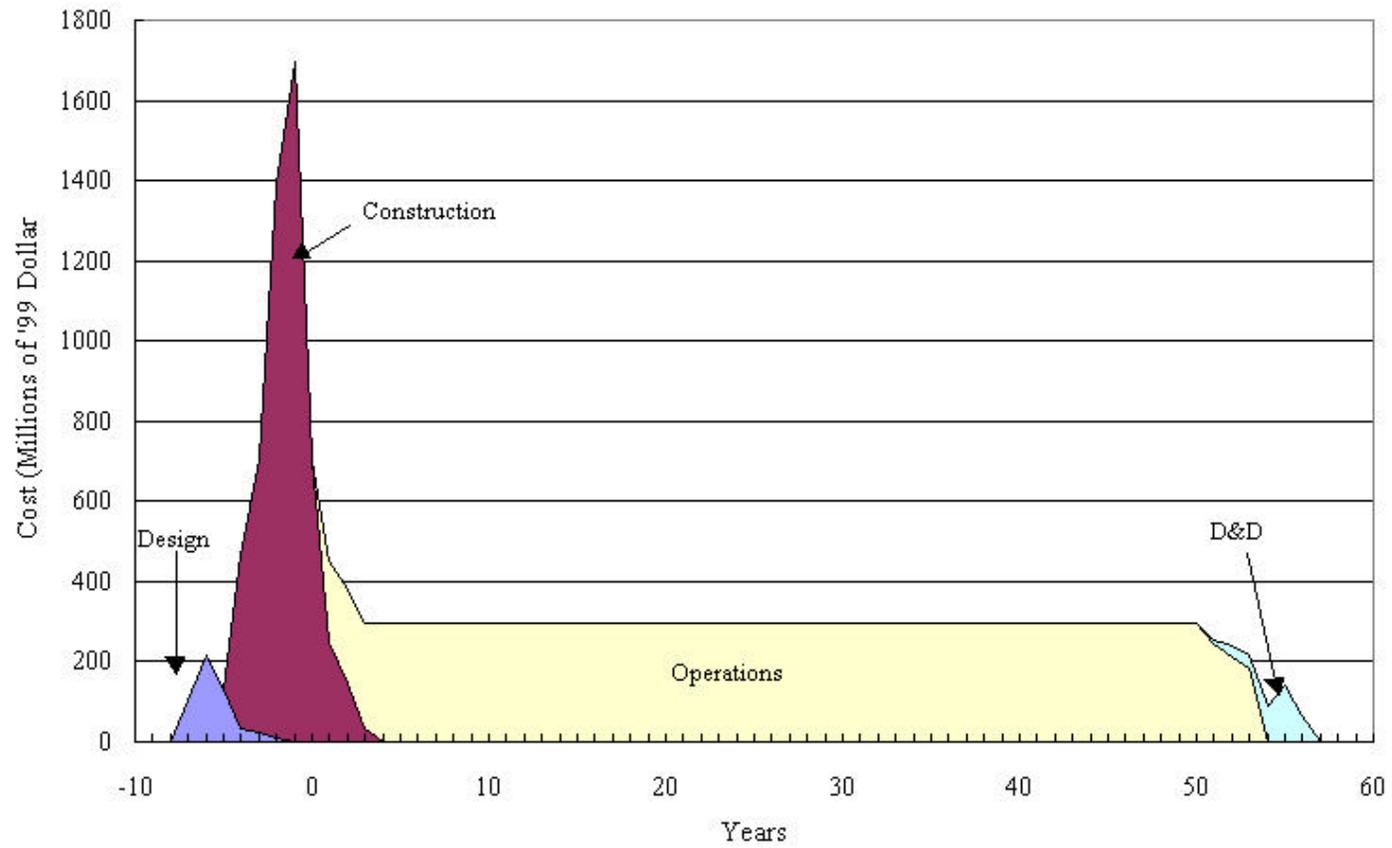
Preliminary Results

- **1st Station Capital Costs, and Operations Costs, by Cost Element (Percent)**
- **1st Station Life-Cycle Costs, by Year**
- **Deployed System Costs by Cost Element (Percent); (by Year)**
- **Deployed System Costs and Electrical Credits, by Year**

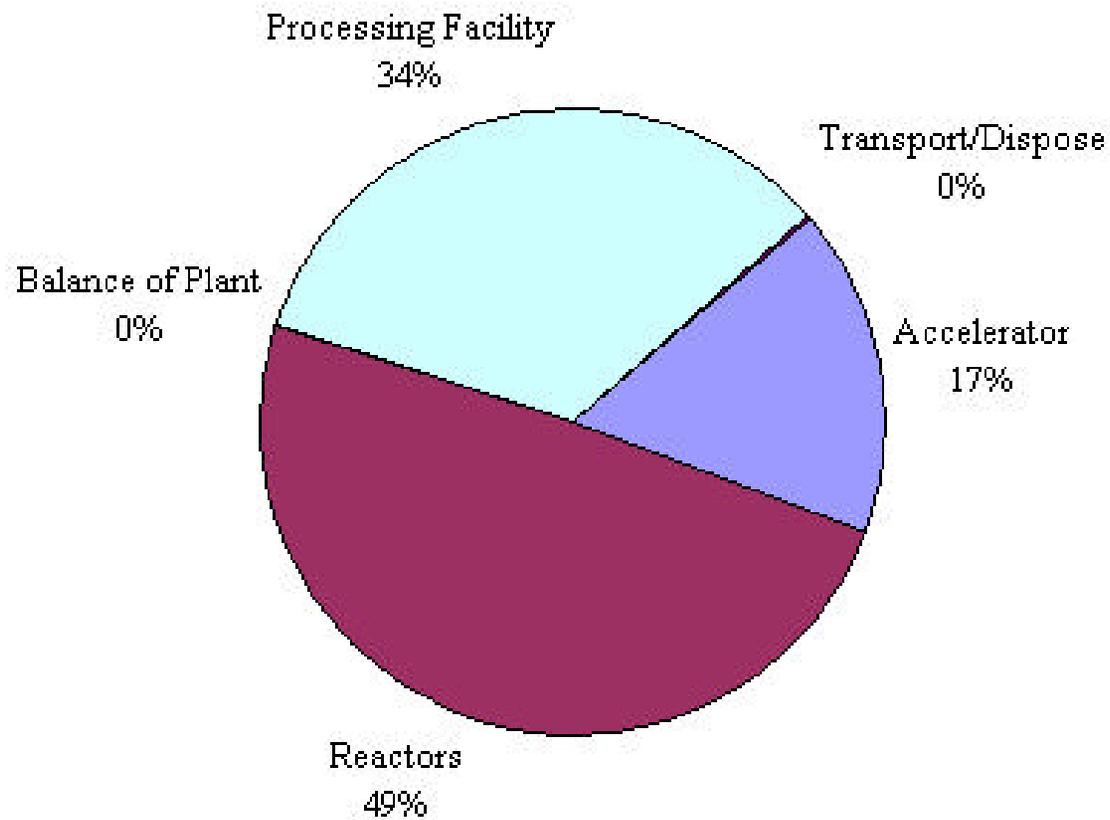
First Station Capital Costs by Cost Element



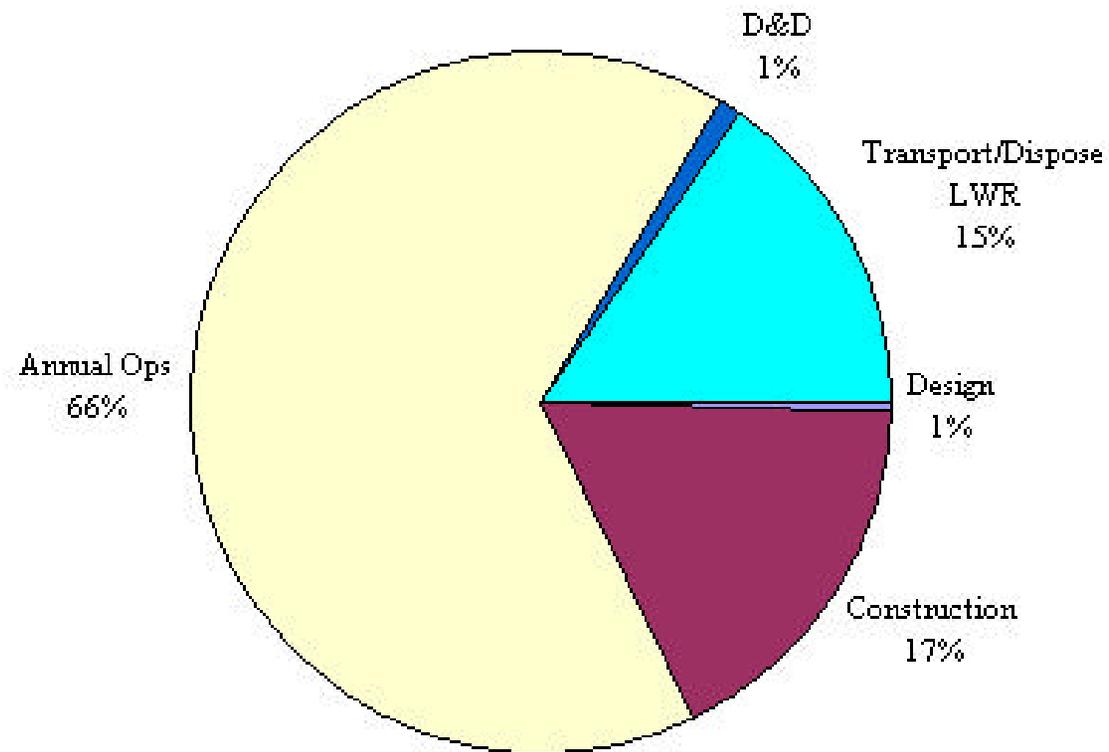
Distribution of Station 1 Production Operations (Life Cycle Costs)



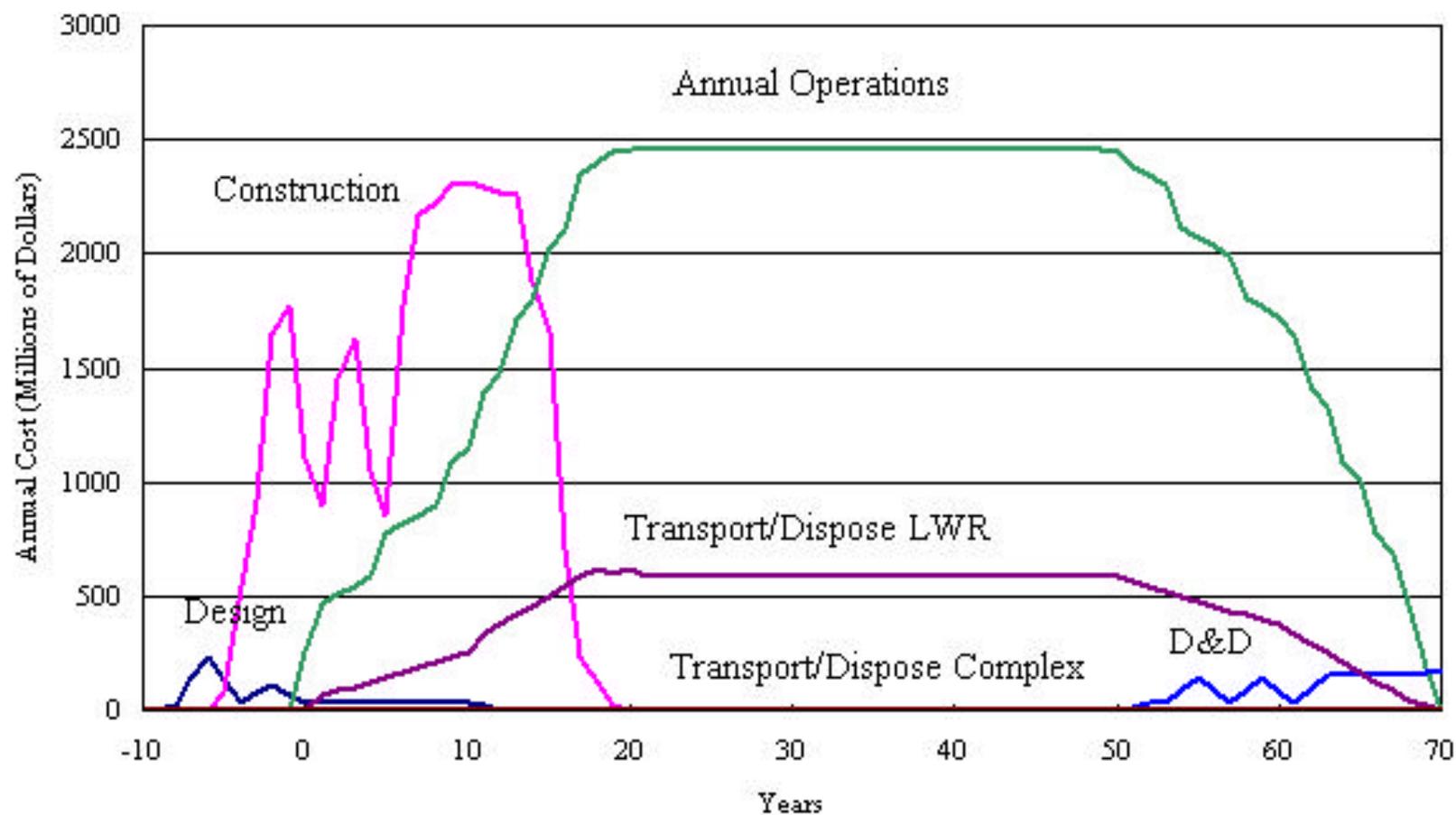
First Station Operations Cost by Cost Element



Deployed System Costs by Cost Element



Time Distribution of System Life Cycle Costs, by Cost Element



Total System Costs with Electricity Credit as a Function of Time

