

**NLH 42** (a) Define the following terms:

- Incremental cost
- Short-run marginal cost
- Long-run marginal cost
- Long run incremental cost

(b) How is each calculated for an integrated electric utility?

(c) How should each of these costs be reflected in rate design?

**RESPONSE:**

(a) Definitions:

- Long Run Incremental Cost (LRIC) – The change in total costs when output is increased or decreased by an increment or block of output for a period of time during which system capacity can be altered.
- Short Run Incremental Cost (SRIC) – The change in variable costs when output is increased or decreased by an increment or block of output for a period of time during which system capacity cannot be altered.

- Long Run Marginal Cost (LRMC) – The change in total costs when output is increased or decreased by one unit of output for a period of time during which system capacity can be altered.
- Short Run Marginal Cost (SRMC) – The change in variable costs when output is increased or decreased by one unit of output for a period of time during which system capacity cannot be altered.

(b) Long Run and Short Run Marginal costs are usually calculated as the first derivative of the total cost and total variable cost functions, respectively. Corresponding incremental cost values can be calculated as the difference in total or variable costs with the addition of an increment or block of output.

(c) Marginal or incremental costs can be used to develop a variety of rates, e.g., seasonal rates, time of day rates, interruptible rates, rates for off-peak service, etc. For greater elaboration see Bonbright, et al., Principles of Public Utility Rates, Public Utility Reports, Inc., Arlington, Virginia, 1988; and Alfred E. Kahn, The Economics of Regulation: Principles and Institutions, John Wiley & Sons, Inc.: New York, 1970 (Volume 1) and 1971 (Volume II).