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N A R U C
National Association of Regulatory Utility Commissioners

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Regulatory Partnership Program

The Energy Regulation Board of Zambia (ERB)
and
the Pennsylvania Public Utility Commission (PUC)
Third Activity

Paul Metro

Rate Base

Depreciation

Rate Base

- Pennsylvania statute requires the rate base of the utility to be set at its “fair value”
- Reproduction value – present cost of rebuilding the entire system less depreciation
- Original Cost

Rate Base

- ✓ Property considered to be used and useful
- ✓ Based upon original cost or fair value
- ✓ Must allow for depreciation

Rate Base Components

- Electric Plant in Service
- Accumulated Depreciation Reserves
- Accumulated Provision for Deferred Income Taxes
- Electric Plant Held for Future Use
- Construction Work in Progress
- Working Capital

Rate Base

- Original Cost
- Depreciation
- Rate of Return

Rate Base

- Pennsylvania Supreme Court ruled that fair value is only “original cost”

Depreciation

- Depreciation is the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of gas plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance

Depreciation

- Method of distributing fixed capital costs over a period of time by allocating annual amounts to expense
- For example: straight line depreciation – Original Cost = $30,000 with a 30 year life – annual depreciation is $1,000

Depreciation

- Calculation of annual and accrued depreciation based on straight line method requires the estimation of survivor curves and the selection of group depreciation procedures

Life Analysis

- Average Service Life
- Survivor Curves
- Retirement Rate Method of Life Analysis

Life Analysis – Average Service Life

- The use of an average service life for a property group implies that the various units in the group have different lives
- The average life may be obtained by determining the separate lives of each unit or by constructing a survivor curve

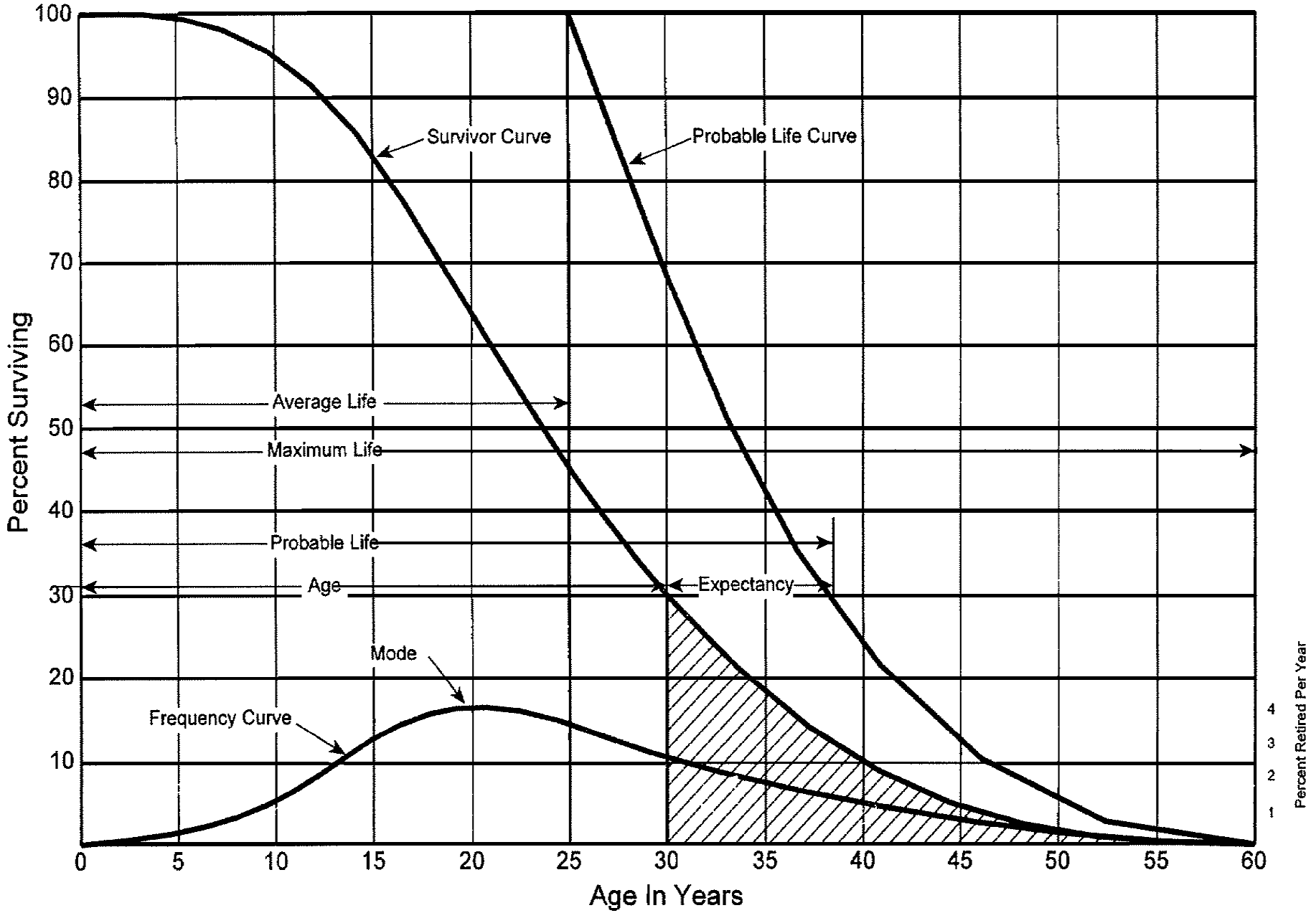

Figure 1. A Typical Survivor Curve and Derived Curves

Life Analysis – Survivor Curves

- Survivor Curves reflect experienced and expected dispersion of service lives
- SC are a systematic and rational means of estimating average service lives to be used to calculate depreciation for utility property

Life Analysis – Survivor Curves

- SCs graphically depict the amount of property existing at each age through the life of an original group
- Sometimes called reliability curves

Life Analysis – Survivor Curves

- SCs depict average life of the group, remaining life expectancy, the probable life and the frequency curve
- Average life – area under the survivor curve divided by ordinate at age zero
- Remaining life – area under the curve, from observation age to max age divided by % surviving at observation age

Life Analysis - Survivor Curve

- Probable life is developed by adding the age and remaining life
- Probable life curve is developed by adding the probable life at each year of age

Iowa Curves

- The range of survivor characteristics experienced by utility property is encompassed by a system of generalized survivor curves

Life Analysis – Retirement Rate Method

- Retirement rate method is an actuarial method of deriving survivor curves using average rates at which property of each age group is retire

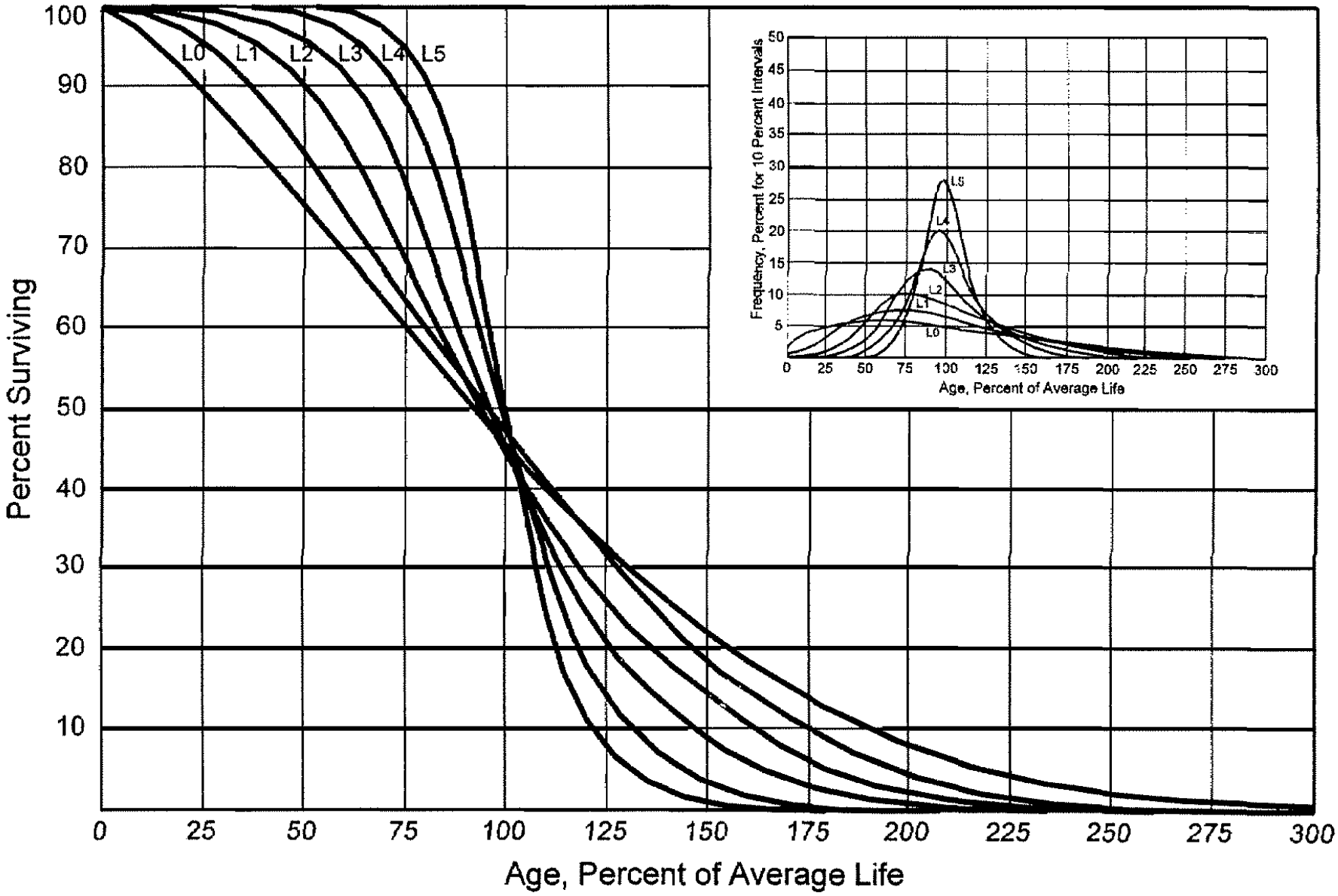

Figure 2. Left Modal or "L" Iowa Type Survivor Curves

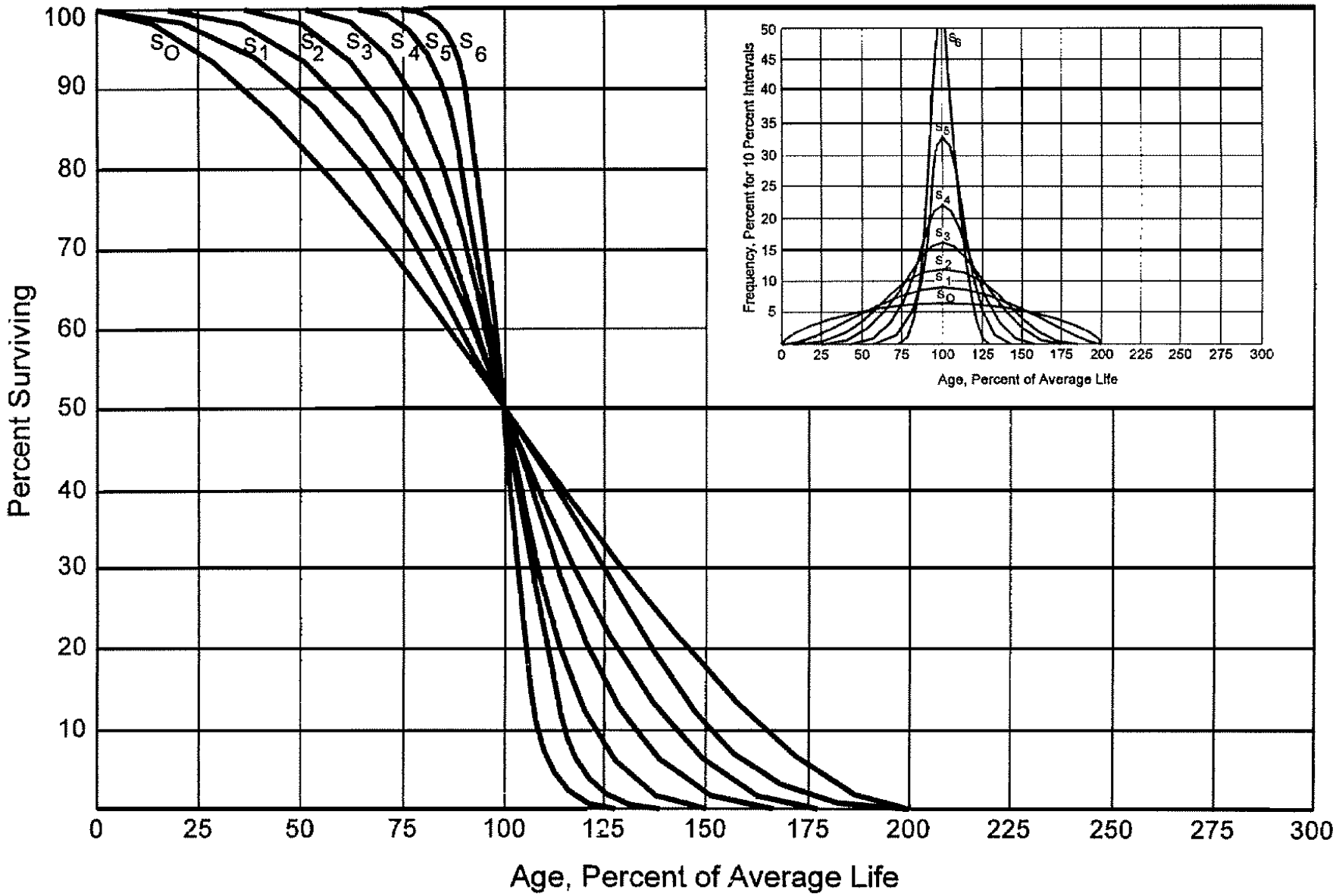

Figure 3. Symmetrical or "S" Iowa Type Survivor Curves

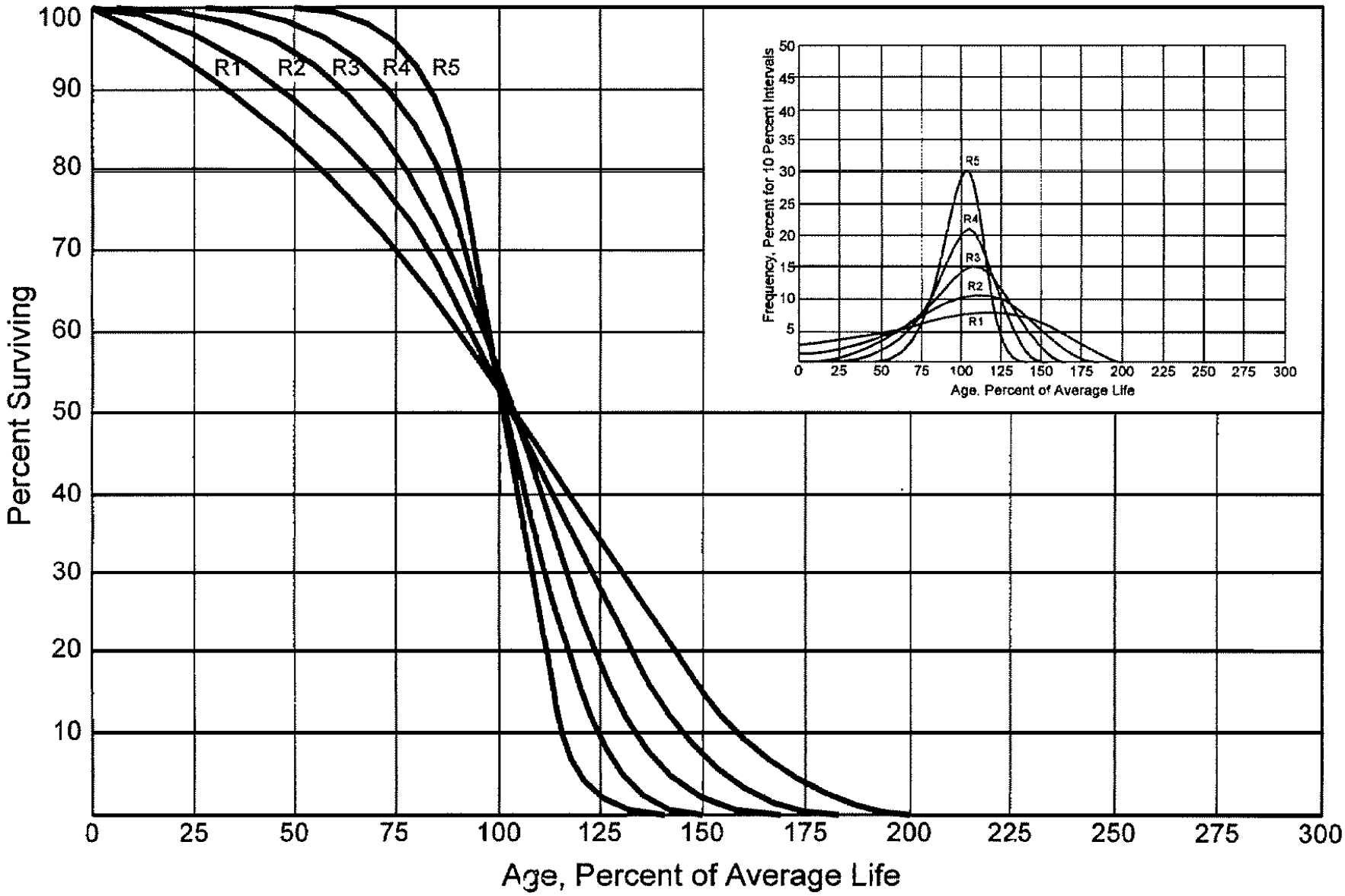

Figure 4. Right Modal or "R" Iowa Type Survivor Curves

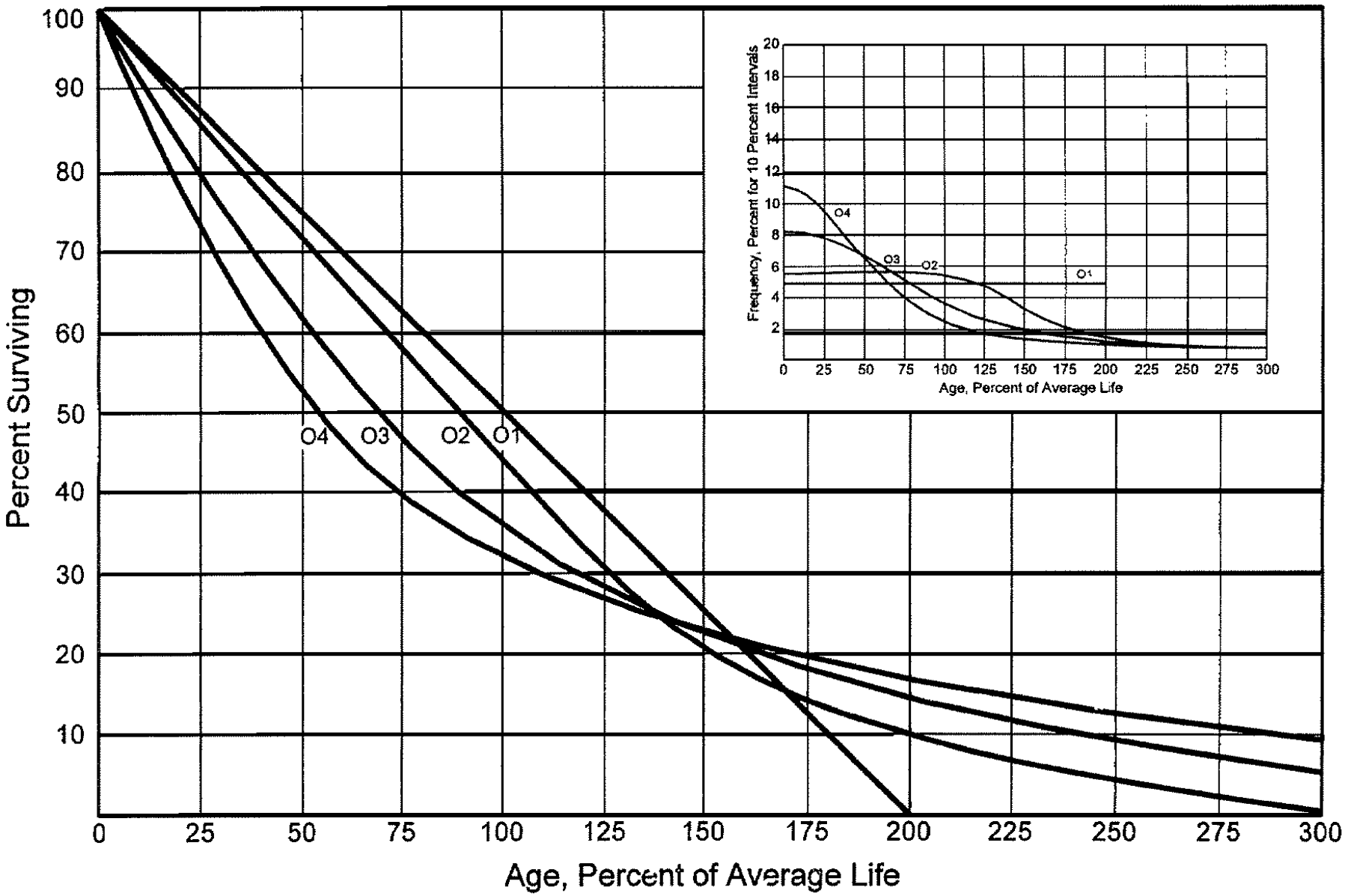

Figure 5. Origin Modal or "O" Iowa Type Survivor Curves