level of project definition determines the estimate class. The other characteristics are considered secondary.

The level of project definition defines maturity, or the extent and types of input information available to the estimating process. Such inputs include project scope definition, requirements documents, specifications, project plans, drawings, calculations, lessons learned from past projects, reconnaissance data, and other information that must be developed to define the project. Each industry will have a typical set of defining deliverables that are used to support the type of estimates used in that industry. The set of deliverables becomes more definitive and complete as the level of project definition (e.g., project engineering) progresses.

For projects, the estimate class designations that follow below are labeled Class 1, 2, 3, 4, and 5. A Class 5 estimate is based upon the lowest level of project definition, and a Class 1 estimate is closest to full project definition and maturity. This "countdown" approach considers that estimating is a process whereby successive estimates are prepared until a final estimate closes the process.

CLASS 5 ESTIMATE
(Typical level of project definition required: >0% to 2% of full project definition.)
Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. As such, some companies and organizations have elected to determine that due to the inherent inaccuracies, such estimates cannot be classified in a conventional and systemic manner. Class 5 estimates, due to the requirements of end use, may be prepared within a very limited amount of time and with little effort expended. Class 5 estimates are prepared for any number of strategic business planning purposes, such as but not limited to market studies, assessment of initial viability, evaluation of alternate schemes, project screening, project location studies, evaluation of resource needs and budgeting, long-range capital planning, etc.

CLASS 4 ESTIMATE
(Typical level of project definition required: 1% to 15% of full project definition.)
Class 4 estimates are generally prepared based on limited information and subsequently have fairly wide accuracy ranges. They are typically used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. Class 4 estimates are prepared for a number of purposes, such as but not limited to, detailed strategic planning, business development, project screening at more developed stages, alternative scheme analysis, confirmation of economic and/or technical feasibility, and preliminary budget approval or approval to proceed to next stage.

CLASS 3 ESTIMATE
(Typical level of project definition required: 10% to 40% of full project definition.)
Class 3 estimates are generally prepared to form the basis for budget authorization, appropriation, and/or funding. Class 3 estimates are typically prepared to support full project funding requests, and become the first of the project phase "control estimate" against which all actual costs and resources will be monitored for variations to the budget. They are used as the project budget until replaced by more detailed estimates. In many owner organizations, a Class 3 estimate may be the last estimate required and could well form the only basis for cost/schedule control.

CLASS 2 ESTIMATE
(Typical level of project definition required: 30% to 70% of full project definition.)
Class 2 estimates are generally prepared to form a detailed control baseline against which all project work is monitored in terms of cost and progress control. For contractors, this class of estimate is often used as the "bid" estimate to establish contract value. Class 2 estimates are typically prepared as the detailed control baseline against which all actual costs and resources will now be monitored for variations to the budget, and form a part of the change/variation control program.

CLASS 1 ESTIMATE
(Typical level of project definition required: 50% to 100% of full project definition.)

Class 1 estimates are generally prepared for discrete parts or sections of the total project rather than generating this level of detail for the entire project. The parts of the project estimated at this level of detail will typically be used by subcontractors for bids, or by owners for check estimates. The updated estimate is often referred to as the current control estimate and becomes the new baseline for cost/schedule control of the project. Class 1 estimates may be prepared for parts of the project to comprise a fair price estimate or bid check estimate to compare against a contractor's bid estimate, or to evaluate/dispute claims. Class 1 estimates are typically prepared to form a current control estimate to be used as the final control baseline against which all actual costs and resources will now be monitored for variations to the budget, and form a part of the change/variation control program. They may be used to evaluate bid checking, to support vendor/contractor negotiations, or for claim evaluations and dispute resolution.

Syn.: COST ESTIMATE TYPE; COST ESTIMATE CLASS; COST ESTIMATE CATEGORY. See also AACE Recommended Practices No. 17R-97 "Cost Estimate Classification System" and No. 18R-97 "Cost Estimate Classification System–As Applied in Engineering, Procurement, and Construction for the Process Industries". (1/04)

COST ESTIMATE TYPE. See COST ESTIMATE CLASSIFICATION SYSTEM. (1/04)

COST ESTIMATING - A predictive process used to quantify, cost, and price the resources required by the scope of an asset investment option, activity, or project. As a predictive process, estimating must address risks and uncertainties. The outputs of estimating are used primarily as inputs for budgeting, cost or value analysis, decision making in business, asset and project planning, or for project cost and schedule control processes.

As applied in the project engineering and construction industry, cost estimating is the determination of quantity and the predicting and forecasting, within a defined scope, of the costs required to construct and equip a facility. Costs are determined utilizing experience and calculating and forecasting the future cost of resources, methods, and management within a scheduled time frame. Included in these costs are assessments and an evaluation of risks. (1/03)

COST ESTIMATING RELATIONSHIP (CER) - In estimating, an algorithm or formula that is used to perform the costing operation. CERs show some resource (e.g., cost, quantity, or time) as a function of one or more parameters that quantify scope, execution strategies, or other defining elements. A CER may be formulated in a manner that in addition to providing the most likely resource value, also provides a probability distribution for the resource value. Cost estimating relationships may be used in either definitive or parametric estimating methods. See DEFINITIVE ESTIMATE and PARAMETRIC ESTIMATE. (1/03)

COST INDEX (PRICE INDEX) - a number which relates the cost of an item at a specific time to the corresponding cost at some arbitrarily specified time in the past. See PRICE INDEX. (11/90)

COST OF CAPITAL - A term, usually used in capital budgeting, to express as an interest rate percentage the overall estimated cost of investment capital at a given point in time, including both equity and borrowed funds. (11/90)

COST OF LOST BUSINESS ADVANTAGE - the cost associated with loss of repeat business and/or the loss of business due to required resources and costs. (11/90)

COST OF OWNERSHIP ¨ the cost of operations, maintenance, follow-on logistical support, and end item and associated support systems. Syn.: OPERATING AND SUPPORT COSTS. [D] (11/90)

COST OF QUALITY - consists of the sum of those costs associated with: (a) cost of quality conformance, (b) cost of quality nonconformance, (c) cost of lost business advantage. (11/90)

COST OF QUALITY CONFORMANCE - the cost associated with the quality management activities of appraisal, training, and prevention. (11/90)

COST OF QUALITY NONCONFORMANCE - the cost associated with deviations involving rework and/or the provision of deliverables that are more than required. (11/90)

COST VALUE - see FUNCTIONAL WORTH. (11/90)

COST-OF-LIVING INDEX - in modern usage, a price index based on a constant utility concept as opposed to a constant basket concept. (11/90)

COSTING - Cost estimating activity that translates quantified technical and programmatic scope information into expressions of the cost and resources required. In costing, this translation is usually done using algorithms or CERs. In the cost estimating process, costing follows scope determination and quantification, and precedes pricing and budgeting. (1/03)

COSTING–ACTIVITY BASED (ABC) - Costing in a way that the costs budgeted to an account truly represent all the resources consumed by the activity or item represented in the account. (1/03)

CRITERIA - a document that provides objectives, guidelines, procedures, and standards to be used to execute the development, design, and/or construction portions of a project. (11/90)

CRITICAL ACTIVITY - any activity on a critical path. (11/90)

CRITICAL PATH - One or more sequences of activities with the least amount of total float activities running from the start event to the finish event in the schedule. It is the longest time path through the schedule. (3/04)

CRITICAL PATH METHOD - a scheduling technique using arrow, precedence, or PERT diagrams to determine the length of a project and to identify the activities and constraints on the critical path. (11/90)

CRITICALITY - a measure of the significance or impact of failure of a product, process, or service to meet established requirements. (11/90)

CRUDE MATERIALS - includes products entering the market for the first time which have not been fabricated or manufactured but will be processed before becoming finished goods (e.g., steel scrap, wheat, raw cotton). Syn: Raw Materials (11/90)

CURRENT COST ACCOUNTING (CCA) - a methodology prescribed by the Financial Accounting Board to compute and report financial activities in constant dollars. (11/90)

CURRENT DOLLARS - dollars of purchasing power in which actual prices are stated, including inflation or deflation. In the absence of inflation or deflation, current dollars equal constant dollars. [A] (11/90)

CURRENT PERIOD (OF A GIVEN PRICE INDEX) - period for which prices are compared to the base period prices. (11/90)

CUSTOM IN THE INDUSTRY - an established practice in a particular industry in the general area. It may be used to show the practice to be followed in a particular circumstance. (11/90)

CYBERNETICS - (1) the field of control and communication theory in general, without specific restriction to any area of application or investigation; (2) the behavior and design of mechanisms, organisms, and/or organizations that receive and generate information and respond to it in order to attain a desired result. (11/90)

DAMAGES, ACTUAL - the increased cost to one party resulting from another party's acts or omissions affecting the contract but not incorporated into a contract modification. (11/90)

DAMAGES, LIQUIDATED - an amount of money stated in the contract as being the liability of a contractor for failure to complete the work by the designated time(s). Liquidated damages ordinarily stop at the point of substantial completion of the project or beneficial occupancy by the owner. (11/90)

DAMAGES, RIPPLE - see IMPACT COST. (11/90)

DATA DATE (DD) - the calendar date that indicates when the project has been updated. (11/90)

DATE FOR THE COMMENCEMENT OF THE CONTRACT TIME - the date when the contract time commences to run and on which the contractor shall start to perform the contractor's obligations under the contract documents. (11/90)

DECELERATION - the opposite of acceleration. A direction, either expressed or implied, to slow down job progress. (11/90)

DECISIONS UNDER CERTAINTY - simple decisions that assume complete information and no uncertainty connected with the analysis of the decisions. (11/90)

DECISIONS UNDER RISK - a decision problem in which the analyst elects to consider several possible futures, the probabilities of which can be estimated. (11/90)

DECISIONS UNDER UNCERTAINTY - a decision for which the analyst elects to consider several possible futures, the probabilities of which cannot be estimated. (11/90)

DECLINING BALANCE DEPRECIATION - method of computing depreciation in which the annual charge is a fixed percentage of the depreciated book value at the beginning of the year to which the depreciation applies. Syn: Percent on Diminishing Value (11/90)

DE-ESCALATE - a method to convert present-day costs or costs of any point in time to costs at some previous date via applicable indexes. (11/90)

DEFECT - a deviation of a severity sufficient to require corrective action. (11/90)

DEFECTIVE - an adjective which, when modifying the work, refers to work that is unsatisfactory, faulty or deficient, or does not conform to the contract documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the contract documents, or has been damaged prior to the engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by the owner at substantial completion in accordance with the contract documents). (11/90)

DEFECTIVE SPECIFICATIONS - specifications and/or drawings which contain errors, omissions, and/or conflicts, which affect or prevent the contractor's performance of the work. (11/90)

DEFECT, LATENT - a defect in the work which cannot be observed by reasonable inspection. (11/90)

DEFECT, PATENT - a defect in the work which can be observed by reasonable inspection. (11/90)

DEFINITIVE ESTIMATE - In estimating practice, describes estimating algorithms or cost estimating relationships that are not highly probabilistic in nature (i.e., the parameters or quantification inputs to the algorithm tend to be conclusive or definitive representations of the scope). Typical definitive estimate algorithms include, but are not limited to, detailed unit and line-item cost techniques (i.e., each specific quantified item is listed and costed separately). (1/03)

DEFLATION - an absolute price decline for a commodity; also, an operation by means of which a current dollar value series is transformed into a constant dollar value series (i.e., is expressed in "real" terms using appropriate price indexes as deflators). (11/90)

DELAY - to cause the work or some portion of the work to start or be completed later than planned or later than scheduled. (4/04)

DELAY, COMPENSABLE - any delay beyond the control and without the fault or negligence of the contractor resulting from the owner-caused changes in the work, differing site conditions, suspensions of the work, or termination for convenience by the owner. (11/90)

DELAY, CONCURRENT - two or more delays in the same time frame or which have an independent effect on the end date. The owner/engineer and the contractor may each be responsible for delay in completing the work. This may bar either party from assessing damage against the other. This may also refer to two or more delays by the same party during a single time period. (11/90)

DELAY, EXCUSABLE - any delay beyond the control and without the fault or negligence of the contractor or the owner, caused by events or circumstances such as, but not limited to, acts of God or of the public enemy, acts of intervenors, acts of government other than the owner, fires, floods, epidemics, quarantine restrictions, freight embargoes, hurricanes, tornadoes, labor disputes, etc. Generally, a delay caused by an excusable delay to another contractor is compensable when the contract documents specifically void recovery of delay costs. (11/90)

DELAY, INEXCUSABLE - any delay caused by events or circumstances within the control of the contractor, such as inadequate crewing, slow submittals, etc, which might have been avoided by the exercise of care, prudence, foresight, or diligence on the part of the contractor. (11/90)

DELAY, NONPREJUDICIAL - any delay impacting a portion of the work within the available total float or slack time, and not necessarily preventing completion of the work within the contract time. (11/90)

DELAY, PREJUDICIAL - any excusable or compensable delay impacting the work and exceeding the total float available in the progress schedule, thus preventing completion of the work within the contract time unless the work is accelerated. (11/90)

DELIVERABLE - a report or product of one or more tasks that satisfy one or more objectives and must be delivered to satisfy contractual requirements. (11/90)

DEMAND FACTOR - (1) the ratio of the maximum instantaneous production rate to the production rate for which the equipment was designed; (2) the ratio between the maximum power demand and the total connected load of the system. (11/90)

DEMOGRAPHIC INDEX - cost indexes developed to deal with geographic cost differences. (11/90)

DEMURRAGE - a charge made on cars, vehicles, or vessels held by or for consignor or consignee for loading or unloading, for forwarding directions or for any other purpose. (11/90)

DEPLETION - (1) a form of capital recovery applicable to extractive property (eg, mines). Depletion can be on a unit-of-output basis related to original or current appraisal of extent and value of the deposit. (Known as percentage depletion.) (2) lessening of the value of an asset due to a decrease in the quantity available. Depletion is similar to depreciation except that it refers to such natural resources as coal, oil, and timber in forests. (11/90)

DEPRECIATED BOOK VALUE - the first cost of the capitalized asset minus the accumulation of annual depreciation cost charges. (11/90)

DEPRECIATION - (1) decline in value of a capitalized asset; (2) a form of capital recovery applicable to a property with a life span of more than one year, in which an appropriate portion of the asset's value is periodically charged to current operations. (11/90)

DETAILED ENGINEERING - the detailed design, drafting, engineering, and other related services necessary to purchase equipment and materials and construct a facility. (11/90)

DETAILED SCHEDULE - a schedule which displays the lowest level of detail necessary to control the project through job completion. The intent of this schedule is to finalize remaining requirements for the total project. (11/90)

DETERMINISTIC MODEL - a deterministic model, as opposed to a Stochastic model, is one which contains no random elements and for which, therefore, the future course of the system is determined by its state at present (and/or in the past). (11/90)

DEVELOPMENT COSTS - those costs specific to a project, either capital or expense items, which occur prior to commercial sales and which are necessary in determining the potential of that project for consideration and eventual promotion. Major cost areas include process, product, and market research and development. (11/90)

DEVIATION - a departure from established requirements. A deviation in the work product may be classified as an imperfection, nonconformance, or defect, based on its severity in failing to meet or unnecessarily exceed the requirements. (11/90)

DEVIATION COSTS - the sum of those costs, including consequential costs such as schedule impact, associated with the rejection or rework of a product, process, or service due to a departure from established requirements. Also may include the cost associated with the provision of deliverables that are more than required. (11/90)

DIFFERENTIAL PRICE ESCALATION RATE - the expected percent difference between the rate of increase assumed for a given item of cost (such as energy), and the general rate of inflation. [A] (11/90)

DIFFERING SITE CONDITIONS - subsurface or latent physical conditions at the site differing materially from those conditions indicated in the contract documents or unknown physical conditions at the site, of an unusual nature, differing materially from conditions normally encountered and generally recognized as inherent in work of the nature provided for in the contract. (11/90)

DIRECT COST - (1) in construction, cost of installed equipment, material and labor directly involved in the physical construction of the permanent facility. (2) in manufacturing, service and other non-construction industries, the portion of operating costs that is generally assignable to a specific product or process area. Usually included are:

a. Input Materials
b. Operating, Supervision, and Clerical Payroll
c. Fringe Benefits
d. Maintenance
e. Utilities
f. Catalysts, Chemicals and Operating Supplies
g. Miscellaneous (Royalties, Services, Packaging, etc.)

Definitions of the above classifications are:

a. Input Material - raw materials which appear in some form as a product. For example, water added to resin formulation is an input material, but sulfuric acid catalyst, consumed in manufacturing high octane alkylate, is not.

b. Operating, Supervision, and Clerical Payroll - wages and salaries paid to personnel who operate the production facilities.

c. Fringe Benefits - payroll costs other than wages not paid directly to the employee. They include costs for:

1) Holidays, vacations, sick leave
2) Federal old age insurance
3) Pensions, life insurance, savings plans, etc.

In contracts with some governmental agencies these items are included in indirect cost.

d. Maintenance Cost - expense incurred to keep manufacturing facilities operational. It consists of:

1) Maintenance Payroll Cost
2) Maintenance Materials and Supplies Cost

Maintenance materials which have a life of more than one year are usually considered capital investment in detailed cash flow accounting.

e. Utilities - the fuel, steam, air, power and water which must be purchased or generated to support the plant operation.

f. Catalysts, Chemicals and Operating Supplies - materials consumed in the manufacturing operation, but not appearing as a product. Operating supplies are a minor cost in process industries and are

sometimes assumed to be in the maintenance materials estimate; but in many industries, mining for example, they are a significant proportion of direct cost.

g. Miscellaneous

1) Royalties - costs paid to others for the use of a proprietary process. Both paid-up and "running" royalties are used. Cost of paid-up royalties are usually on the basis of production rate. Royalties vary widely, however, and are specific for the situation under consideration.

2) Packaging Cost - material and labor necessary to place the product in a suitable container for shipment. Also called Packaging and Container Cost or Packing Cost. Sometimes considered an indirect cost together with distribution costs such as for warehousing, loading and transportation.

Although the direct costs described above are typical and in general use, each industry has unique costs which fall into the "direct cost" category. A few examples are equipment rental, waste disposal, contracts, etc. (11/90)

DISCOUNTED CASH FLOW - (1) the present worth of a sequence in time of sums of money when the sequence is considered as a flow of cash into and/or out of an economic unit; (2) an investment analysis which compares the present worth of projected receipts and disbursements occurring at designated future times in order to estimate the rate of return from the investment or project. Also called Discounted Cash Flow Rate of Return, Interest Rate of Return, Internal Rate of Return, Investor's Method or Profitability Index. (11/90)

DISCOUNTED PAYBACK PERIOD (DPB) - the time required for the cumulative benefits from an investment to pay back the investment cost and other accrued costs considering the time value of money. [A] (11/90)

DISCOUNT FACTOR - a multiplicative number (calculated from a discount formula for a given discount rate and interest period) that is used to convert costs and benefits occurring at different times to a common time. [A] (11/90)

DISCOUNTING - a technique for converting cash flows that occur over time to equivalent amounts at a common time. [A] (11/90)

DISCOUNT RATE - the rate of interest reflecting the investor's time value of money, used to determine discount factors for converting benefits and costs occurring at different times to a base time. The discount rate may be expressed as nominal or real. [A] (11/90)

DISINFLATION - a downward trend in inflation rates, effected by weak or declining demand. It may well portend deflation. (11/90)

DISPATCHING - the selecting and sequence of jobs to be run at individual work stations and the assignment of these jobs to workers. In many companies, dispatching is done by the actual shop line supervisor, set-up worker or lead worker. A dispatcher is usually a representative of the Production Control Department which handles this job assignment task. (11/90)

DISPERSION - the scattering of values from the mean. (11/90)

DISPUTE - a disagreement between the owner and the contractor as to a question of fact or contract interpretation which cannot be resolved to the mutual satisfaction of the parties. (11/90)

DISRUPTION - an action or event which hinders a party from proceeding with the work or some portion of the work as planned or as scheduled. (4/04)

DISTRIBUTABLES - the field portion of a construction project that can be associated with any specific account. Includes the field nonmanual staff, field office, office supplies, temporary construction, utilities, small tools, construction equipment, weather protection, snow removal, lost time, labor burden, etc. When completion cost reports are prepared, the distributable costs may be distributed across the direct accounts. (11/90)

DISTRIBUTION - the broad range of activities concerned with efficient movement of finished products from the end of the production line to the consumer; in some cases it may include the movement of raw materials from the source of supply to the beginning of the production line. These activities include freight transportation, warehousing, material handling, protective packaging, inventory control, plant and warehouse site selection, order processing, market and sales forecasting, customer service, attendant management information systems; and in some cases, buying activities. (11/90)

DISTRIBUTION CURVE - the graph of cumulated frequency as ordinate against the variate value as abscissa, namely the graph of the distribution function. The curve is sometimes known as an "ogive", a name introduced by Galton, because the distribution curve of a normal function is of the ogive shape; but not all distribution curves have this form and the term "ogive" is better avoided or confined to the normal or nearly normal case. (11/90)

DRAWINGS, PLANS - the drawings, plans or reproductions thereof, which show location, character, dimensions, and details of the work to be performed and which are referred to in the contract documents. (11/90)

DUMMY ACTIVITY - an activity, always of zero duration, used to show logical dependency when an activity cannot start before another is complete, but which does not lie on the same path through the network. Normally, these dummy activities are graphically represented as a dashed line headed by an arrow and inserted between two nodes to indicate a precedence relationship or to maintain a unique numbering of concurrent activities. (11/90)

DUMMY START ACTIVITY - an activity entered into the network for the sole purpose of creating a single start for the network. (11/90)

DURABLE GOODS - generally, any producer or consumer goods whose continuous serviceability is likely to exceed three years (e.g., trucks, furniture). (11/90)

DURATION - the time required to accomplish an activity. See ACTIVITY DURATION. (11/90)

DYNAMIC PROGRAMMING - a method for optimizing a set of decisions which may be made sequentially. Characteristically, each decision may be made in the light of the information embodied in a small number of observables called state variables. The incurred cost for each period is a mathematical function of the current state and decision variables, while future states are functions of these variables. The aim of the decision policy is to minimize the total incurred cost, or equivalently the average cost per period. The mathematical treatment of such decision problems involves the theory of functional equations, and usually requires a digital computer for implementation. (11/90)

EARLIEST EXPECTED COMPLETION DATE - the earliest calendar date on which the completion of an activity work package or summary item occurs. [P] (11/90)

EARLY EVENT TIME (EV) - the earliest time at which an event may occur. (11/90)

EARLY FINISH TIME (EF) - the earliest time at which an activity can be completed; equal to the early start of the activity plus its remaining duration. (11/90)

EARLY START TIME (ES) - the earliest time any activity may begin as logically constrained by the network for a specific work schedule. (11/90)

EARLY WORK SCHEDULE - predicated on the parameters established by the proposal schedule and any negotiated changes, the early work schedule defines reportable pieces of work within major areas. The format is developed into a logic network including engineering drawings, bid inquiries, purchase orders, and equipment deliveries, and can be displayed as a time-phased network. The detail of this schedule concentrates on projected engineering construction issue drawings released and equipment deliveries. The activities of the early part of construction are more defined than in the proposal or milestone schedule. (11/90)

EARNED VALUE - the periodic, consistent measurement of work performed in terms of the budget planned for that work. In criteria terminology, earned value is the budgeted cost of work performed. It is compared to the budgeted cost of work scheduled (planned) to obtain schedule performance and it is compared to the actual cost of work performed to obtain cost performance. (11/90)

EARNED VALUE CONCEPT - the measurement at any time of work accomplished (performed) in terms of budgets planned for that work, and the use of these data to indicate contract cost and schedule performance. The earned value of work done is quantified as the budgeted cost for work performed (BCWP) compared to the budgeted cost for work scheduled (BCWS) to show schedule performance and compared to the actual cost of work performed (ACWP) to indicate cost performance. (11/90)

EARNED VALUE REPORTS - cost and schedule performance reports that are part of the performance measurement system. These reports make use of the earned value concept of measuring work accomplishment. (11/90)

EARNINGS VALUE - the present worth of an income producer's probable future net earnings, as prognosticated on the basis of recent and present expense and earnings and the business outlook. (11/90)

ECONOMIC EVALUATION METHODS - a set of economic analysis techniques that considers all relevant costs associated with a project investment during its study period, comprising such techniques as life-cycle cost, benefit-to-cost ratio, savings-to-investment ratio, internal rate of return, and net savings. [A] (11/90)

ECONOMIC LIFE - that period of time over which an investment is considered to be the least-cost alternative for meeting a particular objective. Syn.: PROJECT LIFE. [A] (11/90)

ECONOMIC RETURN - the profit derived from a project or business enterprise without consideration of obligations to financial contributors and claims of others based on profit. (11/90)

ECONOMIC VALUE - the value of property in view of all its expected economic uses, as distinct from its value in view of any particular use. Also, economic value reflects the importance of a property as an economic means to an end, rather than as an end in itself. (11/90)

ECONOMY - the cost or profit situation regarding a practical enterprise or project as in economy study, engineering economy, and project economy. (11/90)

EFFECTIVE DATE OF THE AGREEMENT - the date indicated in the agreement on which it becomes effective, but if no such date is indicated, the date on which the agreement is signed and delivered by the last of the two parties to sign and deliver. (11/90)

EFFECTIVE INTEREST - the true value of interest rate computed by equations for compound interest rate for a l-year period. (11/90)

EFFICIENCY - the ratio of the effective or useful output to the total input in a project. (4/04)

ELEMENTARY COMMODITY GROUPS (ELEMENTARY GROUPS) - the lowest level of goods and services for which a consistent set of value weights is available (11/90)

ENDING EVENT - the event that signifies the completion of all activities leading to that event. (11/90)

ENDING NODE OF NETWORK (ADM) - a node where no activities begin, but one or more activities end. (11/90)

END NETWORK EVENT - the event that signifies the end of a network. (11/90)

ENDOWMENT - a fund established for the support of some project or succession of donations or financial obligations. (11/90)

ENGINEER (IN CONTRACTS) - the individual, partnership, corporation, joint venture, or any combiantion thereof, named as the engineer in the agreement who will have the rights and authority assigned to the engineer in the contract documents. The term "the engineer" means the engineer or the engineer's authorized representative. (11/90)

ENTERPRISE - in total cost management, any endeavor, business, government, group, individual or other entity that owns, controls, or operates strategic assets. (1/02)

EQUITABLE ADJUSTMENT - a change in the contract price and/or time to compensate the contractor for expense or delay incurred due to the actions or lack of action of the owner or the owner's representatives or other occurrences, or to compensate the owner for contract reductions. The objective of an equitable adjustment is to put the contractor on the same relative financial position after the change as before the change. (11/90)

EQUIVALENT SETS OF COMMODITIES - sets of commodities which provide the same total satisfaction to a given group of consumers (without necessarily being identical). (11/90)

EQUIVALENT UNIFORM ANNUAL VALUE - See ANNUAL VALUE. [A] (11/90)

ERROR - any item or activity in a system that is performed incorrectly, resulting in a deviation, e.g., design error, fabrication error, construction error, etc. An error requires an evaluation to determine what corrective action is necessary. (11/90)

ERRORS AND OMISSIONS - deficiencies, usually in design or drafting, in the plans and specifications that must be corrected in order for the facility to operate properly. Errors in plans and specifications are normally items that are shown incorrectly, while omissions are normally items that are not shown at all. (11/90)

ESCALATION - the provision in actual or estimated costs for an increase in the cost of equipment, material, labor, etc, over that specified in the purchase order or contract due to continuing price level changes over time. (11/90)

ESCALATOR CLAUSE - clause contained in collective agreements, providing for an automatic price adjustment based on changes in specified indices. (11/90)

ESTEEM VALUE - see FUNCTIONAL WORTH. (11/90)

ESTIMATE, COST - see COST ESTIMATE, COST ESTIMATE CLASSIFICATION. (1/04)

ESTIMATE, COST–BUDGET ESTIMATE - see COST ESTIMATE CLASSIFICATION–CLASS 4 ESTIMATE, COST ESTIMATE CLASSIFICATION–CLASS 3 ESTIMATE. (1/04)

ESTIMATE, COST–DEFINITIVE ESTIMATE - see COST ESTIMATE CLASSIFICATION–CLASS 2 ESTIMATE, COST ESTIMATE CLASSIFICATION–CLASS 1 ESTIMATE. (1/04)

ESTIMATE, COST - ORDER OF MAGNITUDE ESTIMATE - see COST ESTIMATE CLASSIFICATION–CLASS 5 ESTIMATE. (1/04)

ESTIMATE-TO-COMPLETE - the estimated workhours, costs, and time and/or materials required to complete a work package or summary item (includes applicable overhead unless only direct costs are specified). (11/90)

EVENT - an identifiable single point in time on a project. Graphically, it is represented by a node. An event occurs only when all work preceding it has been completed. It has zero duration. [P] (11/90)

EVENT NAME - an alphanumeric description of an event. [P] (11/90)

EVENT NUMBER - a numerical description of an event for computation and identification. (11/90)

EVENT SLACK - the difference between the latest allowable date and the earliest date for an event. (11/90)

EVENT TIMES - time information generated through the network analysis calculation, which identifies the start and finish times for each event in the network. (11/90)

EXCHANGE VALUE - see FUNCTIONAL WORTH. (11/90)

EXEMPT EMPLOYEES - employees exempt from federal wage and hours guidelines. (11/90)

EXPANSION - any increase in the capacity of a plant facility or unit, usually by added investment. The scope of its possible application extends from the elimination of problem areas to the complete replacement of an existing facility with a larger one. (11/90)

EXPECTATION - the expected value of a function of variate values is its mean value in repeated sampling. Thus, if $t(x_1,x_2,...,x_n)$ is some statistic dependent on variates $x_1,x_2,...,x_n$ with a joint distribution $dF(x_1,x_2,...x_n)$ the expected value of t, if it exists, is

$$\int t(x_1, x_2, ..., x_n) dF(x_1, x_2, ..., x_n)$$

The "expected" value is not necessarily the most frequently occurring value or even a possible value; eg, if a variate can take each of the values 0 and 1 with a probability 1/2 and no other value is possible, the expected value is 1/2. (11/90)

EXPECTED BEGIN DATE - begin date assigned to a specific activity. Syn.: TARGET START DATE. (11/90)

EXPENSE - expenditures of short-term value, including depreciation, as opposed to land and other fixed capital. For factory expense, see PLANT OVERHEAD. (11/90)

EXTRAPOLATION - to infer from values within an observed interval, or to project or extend beyond observed data. (11/90)

EXPECTED DURATION - the length of time anticipated for a particular activity in the PERT method or in arrow or precedence diagramming methods (ADM, PDM). (11/90)

EXPECTED ELAPSED TIME - statistically weighted time estimates or a single knowledgeable estimate for activity duration. If a weighted or mean time estimate, it incorporates an optimistic (a) most likely (m) and pessimistic (b) estimate for the work to be accomplished. (11/90)

FACTOR ANALYSIS - a branch of multivariate analysis in which the observed variates $x_i (i=1,2...,p)$ are supposed to be expressible in terms of a number $m<p$ factors f_j, together with residual elements. (11/90)

FACTORY EXPENSE - see PLANT OVERHEAD. (11/90)

FAIR VALUE - that estimate of the value of a property that is reasonable and fair to all concerned, after every proper consideration has been given due weight. (11/90)

FEE - the charge for the use of one's services to the extent specified in the contract. (11/90)

FEEDBACK - information (data) extracted from a process or situation and used in controlling (directly) or in planning or modifying immediate or future inputs (actions or decisions) into the process or situation. (11/90)

FEEDBACK LOOP - the part of a closed-loop system which allows the comparison of a response to a command. (11/90)

FIELD COST - engineering and construction costs associated with the construction site rather than with the home office. (11/90)

FIELD LABOR OVERHEAD - the sum of the cost of payroll burden, temporary construction facilities, consumables, field supervision, and construction tools and equipment. (11/90)

FIELD ORDER - a written order issued by the engineer to the contractor which orders minor changes in the work but which does not involve an adjustment in the contract price or the contract time. (11/90)

FIELD SUPERVISION - the cost of salaries and wages of all field supervisory and field support staff personnel (excluding general foreman), plus associated payroll burdens, home office overhead, living and travel allowances, and field office operating costs. (11/90)

FIFO (First In, First Out) - a method of determining the cost of inventory used in a product. In this method, the costs of materials are transferred to the product in chronological order. Also used to describe the movement of materials. see LIFO. (11/90)

FINANCIAL LIFE - see VENTURE LIFE. (11/90)

FINISHED GOODS - commodities that will not undergo any further processing and are ready for sale to the user (e.g., apparel, automobiles, bread). (11/90)

FIRST COST - costs incurred in placing a facility into service, including but not limited to costs of planning, design, engineering, site acquisition and preparation, construction, purchase, installation, property taxes paid and interest during the construction period, and construction-related fees. Syn.: INITIAL INVESTMENT COST; INITIAL COST. [A] (11/90)

FIRST EVENT NUMBER - the number of the first event in time for a work package or summary item. This event number defines the beginning of the work package or summary item in relation to the network. (11/90)

FIXED COST - those costs independent of short term variations in output of the system under consideration. Includes such costs as maintenance; plant overhead; and administrative, selling and research expense. For the purpose of cash flow calculation, depreciation is excluded (except in income tax calculations). (11/90)

FIXED-PRICE CONTRACT - a contract where the contractor agrees to furnish services and material at a specified price, possibly with a mutually agreed-upon escalation clause. This type of contract is most often employed when the scope of services to be provided is well defined. (11/90)

FLOAT - (1) in manufacturing, the amount of material in a system or process, at a given point in time, that is not being directly employed or worked upon. (2) in construction, the cushion or slack in any noncritical path in a network planning system. Syn.: SLACK; PATH FLOAT. [P] (11/90)

FORECAST - an estimate and prediction of future conditions and events based on information and knowledge available at the time of the forecast. (11/90)

FORWARD PASS - (1) in construction, network calculations which determine the earliest start/earliest finish time (date) of each activity. (2) in manufacturing, often referred to as forward scheduling, a scheduling technique where the scheduler proceeds from a known start date and computes the completion date for an order usually proceeding from the first operation to the last. (11/90)

FRACTILE - a selected portion of a distribution of values (e.g., quartile). (11/90)

FRAGNET - a portion or fragment of a CPM network usually used to illustrate changes to the whole network. (11/90)

FREE FLOAT (FF) - the amount of time that the completion of an activity may exceed its scheduled finish time without increasing the start time of any succeeding activity. (11/90)

FREE HAUL - the distance every cubic yard of excavated material is entitled to be moved without an additional charge for haul. (11/90)

FREQUENCY DISTRIBUTION - a specification of the way in which the frequencies of members of a population are distributed according to the values of the variates which they exhibit. For observed data the distribution is usually specified in tabular form, with some grouping for continuous variates. A conceptual distribution is usually specified by a frequency function or a distribution function. (11/90)

FREQUENCY FUNCTION - an expression giving the frequency of a variate value x as a function of x; or, for continuous variates, the frequency in an elemental range dx. Unless the contrary is specified, the total frequency is taken to be unity, so that the frequency function represents the proportion of variate values x. From a more sophisticated standpoint the frequency function is most conveniently regarded as the derivative of the Distribution Function. The derivative is also commonly called the probability density function. The generalization to more than one variate is immediate. (11/90)

FREQUENCY THEORY OF PROBABILITY - the frequency theory of probability regards the probability of an event as the limit of the frequency of occurrence of that event in a series of n trials as n tends to infinity. The existence of this limit is an axiom of the theory as proposed by von Mises (1919), but later axiomatizations, eg, by Kolmogoroff (1933) avoid the difficulties associated with it by taking the probability as a measure associated with a set of points (events) and proceeding on the basis of measure theory. This avoids the difficulty only for a mathematician. For the statistician the problem of relating probability to frequency of occurrence remains. (11/90)

FRINGE BENEFITS - employee welfare benefits, ie, expenses of employment such as holidays, sick leave, health and welfare benefits, retirement fund, training, supplemental union benefits, etc. (11/90)

FUNCTION - an expression of conceptual relationships useful in model formulations (e.g., productivity is a function of hours worked). (11/90)

FUNCTIONAL REPLACEMENT COST - the current cost of acquiring the same service potential as embodied by the asset under consideration. (11/90)

FUNCTIONAL USE AREA - the net usable area of a building or project -- exclusive of storage, circulation, mechanical, and similar types of space. (11/90)

FUNCTIONAL SYSTEM - an assembly of parts or components and/or subsystems having one primary end use in the project. It should be noted that secondary and tertiary uses for functional systems are common. (11/90)

FUTURE VALUE - the value of a benefit or a cost at some point in the future, considering the time value of money. Syn.: FUTURE WORTH. [A] (11/90)

FUNCTIONAL WORTH - the lowest overall cost for performing a function. Four types are as follows:

Cost Value - the monetary sum of labor, material, burden, and all other elements of cost required to produce an item or provide a service.

Esteem Value - the monetary measure of the properties of a product or service, which contribute to desirability or salability but not to required functional performance.

Exchange Value - the monetary sum at which a product or service can be traded.

Use Value - the monetary measure of the necessary functional properties of a product or service that contribute to performance. (11/90)

FUTURE WORTH - see FUTURE VALUE. [A] (11/90)

GANTT CHART - see BAR CHART. (11/90)

GENERAL PURPOSE INDEX - a broad-based index designed to reflect general changes in the economy (eg, Gross National Expenditures Implicit Price Index). (11/90)

GENERAL TERMS AND CONDITIONS - that part of a contract, purchase order, or specification that is not specific to the particular transaction but applies to all transactions. (11/90)

GENERAL OVERHEAD - the fixed cost in operation of a business. General overhead is also associated with office, plant, equipment, staffing, and expenses thereof, maintained by a contractor for general business operations. The costs of general overhead are not specifically applicable to any given job or project. See OVERHEAD. (11/90)

GENERAL REQUIREMENTS - distributables and field costs. (11/90)

GIVEN YEAR - the year or period selected for comparison, relative to the base year or base period. (11/90)

GROSS AREA - Generally, the sum of all the floor or slab areas of a project that are enclosed by the exterior skin of the building. (11/90)

GROSS NATIONAL PRODUCT (GNP) - the total national output of goods and services at the market prices for the stated year. (11/90)

GUIDELINE - a document that recommends methods to be used to accomplish an objective. (11/90)

HAMMOCK - an aggregate or summary activity spanning the nodes of two or more activities and reported at a summary management level. (11/90)

HANGER - a beginning or ending node not intended in the network (a break in a network path). (11/90)

HAUL DISTANCE - the distance measured along the center line or most direct practical route between the center of mass of excavation and the center of mass finally placed. It is the average distance material is moved by a vehicle. (11/90)

HEDGE - in master production scheduling, a quantity of stock used to protect against uncertainty in demand. The hedge is similar to safety stock, except that a hedge has the dimension of timing as well as amount. (11/90)

HIGHEST AND BEST USE - the valuation concept that requires consideration of all appropriate purposes or uses of the subject property in order to determine the most profitable likely utilization. (11/90)

HISTOGRAM - see BLOCK DIAGRAM. (11/90)

HOLDING TIME - time that an item is not operational so that it may be serviced. (11/90)

HOME OFFICE COST - those necessary costs involved in the conduct of everyday business, which can be directly assigned to specific projects, processes, or end products, such as engineering, procurement, expediting, legal fees, auditor fees inspection, estimating, cost control, taxes, travel, reproduction, communications, etc. (11/90)

IDEAL INDEX - the geometric mean of the Laspeyres index and the Paasche index. (11/90)

IDLE EQUIPMENT COST - the cost of equipment that remains on site ready for use but is placed in a standby basis. Ownership or rental costs are still incurred while the equipment is idle. (11/90)

IMPACT COST - added expenses due to the indirect results of a changed condition, delay, or changes that are a consequence of the initial event. Examples of these costs are premium time, lost efficiency, and extended field and home office overhead. (4/04)

IMPERFECTION - a deviation that does not affect the use or performance of the product, process, or service. In practice, imperfections are deviations that are accepted as-is. (11/90)

IMPOSED DATE - a date externally assigned to an activity that establishes the earliest or latest date in which the activity is allowed to start or finish. (11/90)

IMPOSED FINISH DATE - a predetermined calendar date set without regard to logical considerations of the network, fixing the end of an activity and all other activities preceding that ending node. (11/90)

IMPOSSIBILITY - An inability to meet contract requirements because it was in fact physically impossible to do so (Actual Impossibility). (11/90)

IMPRACTICABILITY - inability to perform because of extreme and unreasonable difficulty, expense, injury, or loss involved. This is sometimes considered Practical Impossibility. (11/90)

IMPUTATION (OF PRICE MOVEMENT) - the assignment of known price changes to a certain commodity on the basis of the assumed similarity of price movement. (11/90)

INCOME - used interchangeably with profit. Avoid using Income instead of Sales Revenue. See PROFIT. (11/90)

INCREMENTAL COSTS (BENEFITS) - The additional cost (benefit) resulting from an increase in the investment in a project. Syn.: MARGINAL COST (BENEFIT). [A] (11/90)

INDEPENDENT EVENT - an event which in no way affects the probability of the occurrence of another event. (11/90)

INDIRECT COSTS - (1) in construction, all costs which do not become a final part of the installation, but which are required for the orderly completion of the installation and may include, but are not limited to, field administration, direct supervision, capital tools, startup costs, contractor's fees, insurance, taxes, etc; (2) In manufacturing, costs not directly assignable to the end product or process, such as overhead and general purpose labor, or costs of outside operations, such as transportation and distribution. Indirect manufacturing cost sometimes includes insurance, property taxes, maintenance, depreciation, packaging, warehousing and loading. In government contracts, indirect cost is often calculated as a fixed percent of direct payroll cost. (11/90)

INDIVIDUAL PRICE INDEX - an index which measures the price change for a particular commodity and which may be computed as the ratio of its prices at two points in time. (11/90)

INEFFICIENCY - level of production or performance that is less than that which could have been achieved under as-planned normal working conditions. Some of the causes that may lead to inefficient performance are changes, delays, and differing site conditions. (4/04)

INFLATION - a rise in the general price level, usually expressed as a percentage rate. [A] (11/90)

INITIAL COST - see FIRST COST. [A] (11/90)

INITIAL INVESTMENT COST - see FIRST COST. [A] (11/90)

IN-PLACE VALUE - value of a physical property, i.e., market value plus costs of transportation to site and installation. (11/90)

IN-PROGRESS INVENTORY - see WORK-IN-PROCESS. (11/90)

IN-PROGRESS ACTIVITY - an activity that has been started but is not completed on the reporting date. (11/90)

INPUT-OUTPUT ANALYSIS - a matrix which provides a quantitative framework for the description of an economic unit. Basic to input-output analysis is a unique set of input-output ratios for each production and distribution process. If the ratios of input per unit of output are known for all production processes, and if the total production of each end product of the economy, or of the section being studied is known, it is possible to compute precisely the production levels required at every intermediate stage to supply the total sum of end products. Further, it is possible to determine the effect at every point in the production process of a specified change in the volume and mix of end products. (11/90)

INTANGIBLES - (1) in economy studies, conditions or economy factors that cannot be readily evaluated in quantitative terms as in money; (2) in accounting, the assets that cannot be reliably evaluated (e.g., goodwill). (11/90)

INTEREST - (1) financial share in a project or enterprise; (2) periodic compensation for the lending of money; (3) in economy study, synonymous with required return, expected profit, or charge for use of capital; (4) the cost for the use of capital. Sometimes referred to as the Time Value of Money. (11/90)

INTEREST RATE - the ratio of the interest payment to the principal for a given unit of time and is usually expressed as a percentage of the principal. (11/90)

INTEREST RATE, COMPOUND - the rate earned by money expressed as a constant percentage of the unpaid balance at the end of the previous accounting period. Typical time periods are yearly, semiannually, monthly, and instantaneous. (11/90)

INTEREST RATE, EFFECTIVE - an interest rate for a stated period (per year unless otherwise specified) that is the equivalent of a smaller rate of interest that is more frequently compounded. (11/90)

INTEREST RATE, NOMINAL - the customary type of interest rate designation on an annual basis without consideration of compounding periods. A frequent basis for computing periodic interest payments. (11/90)

INTEREST RATE OF RETURN - see PROFITABILITY INDEX. (11/90)

INTERFACE ACTIVITY - an activity connecting an event in one subnetwork with an event in another subnetwork, and representing a logical or imposed interdependence between them. (11/90)

INTERFACE NODE - a common node for two or more subnets representing logical interdependence. (11/90)

INTERFERENCE - conduct that interrupts the normal flow of operations and impedes performance. A condition implied in every construction contract is that neither party will do anything to hinder the performance of the other party. (11/90)

INTERIM DATES - dates established in the contract designating the start or the completion of designated facilities or features of a facility. Interim dates are also referred to as Intermediate Access or Intermediate Completion Dates. (11/90)

INTERMEDIATE EVENTS - detailed events and activities, the completion of which are necessary for and lead to the completion of a major milestone. (11/90)

INTERMEDIATE MATERIALS - commodities that have been processed but require further processing before they become finished goods (e.g., fabric, flour, sheet metal). (11/90)

INTERMEDIATE NODE - a node where at least one activity begins and one activity ends. (11/90)

INTERNAL RATE OF RETURN (IRR) - the compound rate of interest that, when used to discount study period costs and benefits of a project, will make the two equal. See PROFITABILITY INDEX. [A] (11/90)

INVENTORY - raw materials, products in process, and finished products required for plant operation or the value of such material and other supplies, e.g., catalysts, chemicals, spare parts. (11/90)

INVESTMENT - the sum of the original costs or values of the items that constitute the enterprise; used interchangeably with capital; may include expenses associated with capital outlays such as mine development. (11/90)

INVESTMENT COST - includes first cost and later expenditures that have substantial and enduring value (generally more than one year) for upgrading, expanding, or changing the functional use of a facility, product, or process. [A] (11/90)

INVESTOR'S METHOD - see DISCOUNTED CASH FLOW. (11/90)

ITEM - a commodity designated and defined specifically for direct price observation. (11/90)

JOB OVERHEAD - the expense of such items as trailer, toilets, telephone, superintendent, transportation, temporary heat, testing, power, water, cleanup, and similar items possibly including bond and insurance associated with the particular project. (11/90)

JUDGMENTAL SAMPLING - a procedure of selecting the sample which is based on specific criteria established by sample designers. The selection of priced items and outlets is not a probability sample; that is, it is not based on random chance. (11/90)

KEY ACTIVITY - an activity that is considered of major significance. A key activity is sometimes referred to as a milestone activity. (11/90)

LABOR BURDEN - taxes and insurances the employer is required to pay by law based on labor payroll, on behalf of or for the benefit of labor. (In the US these are federal old age benefits, federal unemployment insurance tax, state unemployment tax, and worker's compensation). (11/90)

LABOR COST, MANUAL - the salary plus all fringe benefits of construction workers and general labor on construction projects and labor crews in manufacturing or processing areas which can be definitely assigned to one product or process area or cost center. (11/90)

LABOR COST, NON-MANUAL - in construction, normally refers to field personnel other than crafts and includes field administration and field engineering. (11/90)

LABOR FACTOR - the ratio between the workhours actually required to perform a task under project conditions and the workhours required to perform an identical task under standard conditions. (11/90)

LADDERING - a method of showing the logic relationship of a set of several parallel activities with the arrow technique. (11/90)

LAG - specified time increment or delay between the start or completion of an activity and the start or completion of a successor activity. [P] (11/90)

LAG RELATIONSHIP - the four basic types of lag relationships between the start and/or finish of a work item and the start and/or finish of another work item are:

1. Finish to Start
2. Start to Finish
3. Finish to Finish
4. Start to Start (11/90)

LASPEYRES-TYPE PRICE INDEX (STRICT APPELLATION) - a composite index founded on a Constant Basket which is taken from the base period of this index. (11/90)

LATE FINISH (LF) - the latest time an activity may be completed without delaying the project finish date. (11/90)

LATENT CONDITION - a concealed, hidden, or dormant condition that cannot be observed by a reasonable inspection. (11/90)

LATEST EVENT TIME (LET) - the latest time an event may occur without increasing the project's scheduled completion date. (11/90)

LATE START - the latest time at which an activity can start without lengthening the project. (11/90)

LATEST REVISED ESTIMATE - the sum of the actual incurred costs plus the latest estimate-to-complete for a work package or summary item as currently reviewed and revised, or both (including applicable overhead where direct costs are specified). (11/90)

LAWS AND REGULATIONS - laws, rules, regulations, ordinances, codes and/or orders. (11/90)

LEAD - a PDM constraint introduced before a series of activities to schedule them at a later time. (11/90)

LEARNING CURVE - a graphic representation of the progress in production effectiveness as time passes. Learning curves are useful planning tools, particularly in the project oriented industries where new products are phased in rather frequently. The basis for the learning curve calculation is the fact that workers will be able to produce the product more quickly after they get used to making it. (11/90)

LETTER OF CREDIT - a vehicle that is used in lieu of retention and is purchased by the contractor from a bank for a predetermined amount of credit that the owner may draw against in the event of default in acceptance criteria by the contractor. Also applies when an owner establishes a line of credit in a foreign country to provide for payment to suppliers of contractors for goods and services supplied. (11/90)

LEVEL FINISH/SCHEDULE/ (SF) - the date when the activity is scheduled to be completed using the resource allocation process. Level finish is equal to the level start plus duration except when split. (11/90)

LEVEL FLOAT - the difference between the level finish and the imposed finish date. (11/90)

LEVELIZED FIXED-CHARGE RATE - the ratio of uniform annual revenue requirements to the initial investment, expressed as a percent. (11/90)

LEVEL OF EFFORT (LOE) - support effort (e.g., vendor liaison) that does not readily lend itself to measurement of discrete accomplishment. It is generally characterized by a uniform rate of activity over a specific period of time. (11/90)

LEVEL START/SCHEDULE/ (SS) - the date the activity is scheduled to begin using the resource allocation process. This date is equal to or later in time than early start. (11/90)

LEVERAGE (TRADING ON EQUITY) - the use of borrowed funds or preferred stock in the intent of employing these "senior" funds at a rate of return higher than their cost in order to increase the return upon the investment of the residual owners. (11/90)

LIFE - (1) physical: that period of time after which a machine or facility can no longer be repaired in order to perform its design function properly. (2) service: the period of time that a machine or facility will satisfactorily perform its function without a major overhaul. See also VENTURE LIFE; STUDY PERIOD; ECONOMIC LIFE. (11/90)

LIFE CYCLE - the stages, or phases that occur during the lifetime of an object or endeavor. A life cycle presumes a beginning and an end with each end implying a new beginning. In life cycle cost or investment analysis, the life cycle is the length of time over which an investment is analyzed (i.e., study period). See also STUDY PERIOD; LIFE. [A] (1/02)

LIFE CYCLE; ASSET - the stages, or phases of asset existence during the life of an asset. Asset life cycle stages typically include ideation, creation, operation, modification, and termination. (1/02)

LIFE CYCLE; PROJECT - the stages or phases of project progress during the life of a project. Project life cycle stages typically include ideation, planning, execution, and closure. (1/02)

LIFE-CYCLE COST (LCC) METHOD - a technique of economic evaluation that sums over a given study period the costs of initial investment (less resale value), replacements, operations (including energy use), and maintenance and repair of an investment decision (expressed in present or annual value terms). [A] (11/90)

LIFO (Last In, First Out) - a method of determining the cost of inventory used in a product. In this method, the costs of material are transferred to the product in reverse chronological order. LIFO is used to describe the movement of goods. See FIFO. (11/90)

LIMIT (Lot size Inventory Management Interpolation Technique) - a technique for looking at the lot sizes for groups of products to determine what effect economic lot sizes will have on the total inventory and total setup costs. (11/90)

LINEAR PROGRAMMING - mathematical techniques for solving a general class of optimization problems through minimization (or maximization) of a linear function subject to linear constraints. For example, in blending aviation fuel, many grades of commercial gasoline may be available. Prices and octane ratings, as well as upper limits on capacities of input materials which can be used to produce various grades of fuel are given. The problem is to blend the various commercial gasolines in such a way that (1) cost will be minimized (profit will be maximized), (2) a specified optimum octane rating will be met, and (3) the need for additional storage capacity will be avoided. (11/90)

LINE OF CREDIT - generally an informal understanding between the borrower and the bank as to the maximum amount of credit that the bank will provide the borrower at any one time. (11/90)

LINKING PROCEDURE - a procedure by which a "new" series of indexes is connected to an "old" series in a given link period, generally because of a change in baskets. Actually, indexes of the new series with link period as time base are multiplied by the old index for the link period as the given period. See SPLICING TECHNIQUE. (11/90)

LOAD FACTOR - (1) a ratio that applies to physical plant or equipment average load/maximum demand, usually expressed as a percentage. It is equivalent to percent of capacity operation if facilities just accommodate the maximum demand; (2) the ratio of average load to maximum load. (11/90)

LOAD LEVELING - the technique of averaging, to a workable number, the amount or number of people working on a given project or in a given area of a project at a particular point in time. Load leveling is a benefit of most scheduling techniques and is necessary to insure a stable use of resources. Syn.: WORK POWER LEVELING. (11/90)

LOCAL COST - in foreign work, the cost of local labor, equipment taxes, insurance, equipment, and construction materials incorporated in a construction project, with local currencies. This includes the

finishing of imported goods using local labor and materials, the cost of transforming imported raw or semi-finished products using local labor and plant facilities and the marketing of locally produced products. (11/90)

LOCATION FACTOR - an estimating factor used to convert the cost of an identical plant from one location to another. This factor takes into consideration the impact of climatic conditions, local infrastructure, local soil conditions, safety and environmental regulations, taxation and insurance regulations, labor availability and productivity, etc. (11/90)

LOGIC - Relationship describing the interdependency of starts and finishes between activities or events. Every activity should have a predecessor (except for the initial activity or event), and every activity should have a successor (except for the ending activity or event). (3/04)

LOGIC NETWORK DIAGRAM - Visual representation of relationship between activities. See also NETWORK. (3/04)

LOGICAL RESTRAINT - a dummy arrow or constraint connection that is used as a logical connector but that does not represent actual work items. It is usually represented by a dotted line, and is sometimes called a dummy because it does not represent work. It is an indispensable part of the network concept when using the arrow diagramming method of CPM scheduling. (11/90)

LOOP - a path in a network closed on itself passing through any node or activity more than once, or, a sequence of activities in the network with no start or end. (11/90)

LOSS OF PRODUCTIVITY/EFFICIENCY - see INEFFICIENCY. (11/90)

LOST PRODUCTIVITY - see INEFFICIENCY. (4/04)

LOT BATCH - a definite quantity of some product manufactured under conditions of production that are considered uniform. (11/90)

LOT SIZE - the number of units in the lot. (11/90)

LUMP-SUM - the complete in-place cost of a system, a subsystem, a particular item, or an entire project. Lump-sum contracts imply that no additional charges or costs will be assessed against the owner. See FIXED-PRICE CONTRACT. (11/90)

MAINTENANCE AND REPAIR COST - the total of labor, material, and other related costs incurred in conducting corrective and preventative maintenance and repair on a facility, on its systems and components, or on both. Maintenance does not usually include those items that cannot be expended within the year purchased. Such items must be considered as fixed capital. [B] (11/90)

MAJOR COMPONENTS - part of the aggregation structure of a price index (eg, a CPI can be subdivided into major components of food, housing, clothing, transportation, health and personal care, recreation, reading and education, tobacco and alcohol). (11/90)

MAJOR MILESTONE - the most significant milestones in the project's life or duration, representing major accomplishments or decision points; usually associated with the first breakdown level in the work breakdown structure. [P] (11/90)

MAJOR SYSTEM ACQUISITION PROJECTS - those projects that are directed at and are critical to fulfilling a mission, entail the allocation of relatively large resources, and warrant special management attention. (11/90)

MANAGEMENT CONTROL SYSTEMS - the systems (e.g., planning, scheduling, budgeting, estimating, work authorization, cost accumulation, performance measurement, etc) used by owners, engineers, architects, and contractors to plan and control the cost and scheduling of work. [P] (11/90)

MANAGEMENT RESERVE - An amount added to an estimate to allow for discretionary management purposes outside of the defined scope of the project as otherwise estimated. Unlike contingency, the estimated reserve is not expected to be spent unless management so directs, and a reserve is generally not included in all estimates. An example of when a reserve might be included in a project estimate is when a project's schedule, safety, or operability are so critical to business objectives that business management authorizes reserve funds for project management to use at their discretion for any scope changes they feel are needed to meet the business objectives. Syns.: Reserve or Reserve Allowance. (1/03)

MANAGEMENT SCIENCE - the application of methods and procedures including sophisticated mathematical techniques to facilitate decision making in the handling, direction, and control of projects and manufacturing operations. (11/90)

MANUFACTURING COST - the total of variable and fixed or direct and indirect costs chargeable to the production of a given product, usually expressed in cents or dollars per unit of production, or dollars per year. Transportation and distribution costs, and research, development, selling and corporate administrative expenses are usually excluded. See also OPERATING COST. (11/90)

MANUFACTURING RESOURCE PLANNING (MRP II) - a method for the effective planning of all the resources of a manufacturing company. Ideally, it addresses operational planning in units, financial planning in dollars, and has a simulation capability to answer "what if" questions. It is made up of a variety of functions, each linked together: business planning, production planning, master production scheduling, material requirements planning, capacity requirements planning, and the execution systems for capacity and priority. Outputs from these systems would be integrated with financial reports such as the business plan, purchase commitment report, shipping budget, inventory projections in dollars, etc. Manufacturing resource planning is a direct outgrowth and extension of material requirement planning. (11/90)

MAPI METHOD - (1) a procedure for replacement analysis sponsored by the Machinery and Allied Products Institute; (2) a method of capital investment analysis which has been formulated by the Machinery and Allied Products Institute. This method uses a fixed format and provides charts and graphs to facilitate calculations. A prominent feature of this method is that it explicitly includes obsolescence. (11/90)

MARGINAL ANALYSIS - an economic concept concerned with those incremental elements of costs and revenue which are associated directly with a specific course of action, normally using available current costs and revenue as a base and usually independent of traditional accounting allocation procedures. (11/90)

MARGINAL COST (BENEFIT) - see INCREMENTAL COST (BENEFIT). [A] (11/90)

MARKETING - the broad range of activities concerned primarily with the determination of consumer or user demands or desires, both existing and potential; the satisfaction of these demands or desires

through innovation or modification; and the building of buyer awareness of product or service availability through sales and advertising efforts. (11/90)

MARKETING COST ANALYSIS - the study and evaluation of the relative profitability or costs of different marketing operations in terms of customer, marketing units, commodities, territories, or marketing activities. Typical tools include cost accounting. (11/90)

MARKETING RESEARCH - the systematic gathering, recording, and analyzing of data about problems relating to the marketing of goods and services. Such research may be undertaken by impartial agencies or by business firms, or their agents. Marketing research is an inclusive term which includes various subsidiary types:

1. Market Analysis, of which product potential is a type, which is the study of size, location, nature, and characteristics of markets.

2. Sales Analysis (or Research), which is the systematic study and comparison of sales (or consumption) data.

3. Consumer Research, of which motivation research is a type which is concerned chiefly with the discovery and analysis of consumer attitudes, reactions, and preferences. (11/90)

MARKET VALUE - the monetary price upon which a willing buyer and a willing seller in a free market will agree to exchange ownership, both parties knowing all the material facts but neither being compelled to act. The market value fluctuates with the degree of willingness of the buyer and seller and with the conditions of the sale. The use of the term market suggests the idea of barter. When numerous sales occur on the market, the result is to establish fairly definite market prices as the basis of exchanges. (11/90)

MARK-UP - as variously used in construction estimating, includes such percentage applications as general overhead, profit, and other indirect costs. When mark-up is applied to the bottom of a bid sheet for a particular item, system, or other construction price, any or all of the above items (or more) may be included, depending on local practice. (11/90)

MASTER PRODUCTION SCHEDULE (MPS) - for selected items, a statement of what the company expects to manufacture. It is the anticipated build schedule for those selected items assigned to the master scheduler. The master scheduler maintains this schedule and, in turn, it becomes a set of planning numbers which "drives" MRP. It represents what the company plans to produce expressed in specific configurations, quantities, and dates. The MPS should not be confused with a sales forecast which represents a statement of demand. The master production schedule must take forecast plus other important considerations (backlog, availability of material, availability of capacity, management policy and goals, etc.) into account prior to determining the best manufacturing strategy. (11/90)

MASTER SCHEDULE - see MASTER PRODUCTION SCHEDULE. (11/90)

MASTER SCHEDULE ITEM - a part number selected to be planned by the master scheduler. The item would be deemed critical in terms of its impact on lower level components and/or resources such as skilled labor, key machines, dollars, etc. A master schedule item may be an end item, a component, a pseudo number, or a planning bill of material. (11/90)