Q: Did the 2010 Cost Reforecast include contingency?

A: Yes. The 2010 Cost Reforecast included ** [redacted] ** in contingency.

Q: Was the contingency included in the 2010 Cost Reforecast appropriate?

A: Yes, I believe it was, based on the risks that KCP&L knew at the time. These risks are discussed in the testimony of Company witnesses Mr. Bell and Mr. Davis and in the Project's Risk Assessment (Schedule RNB2010-1)

Q: What is your opinion regarding the 2010 Cost Reforecast?

A: From a process standpoint, the project team performed a very thorough review and analysis of the remaining costs and risks through the end of the project. The 2010 Cost Reforecast should provide KCP&L's project management team with the template and necessary tools to effectively manage the project's remaining costs.

REPORTING OF PROJECT COSTS

Q: Are you familiar with the cost portfolio that KCP&L was using for tracking the Iatan Project?

A: Yes.

Q: What is your opinion of KCP&L's cost portfolio?

A: The cost portfolio that KCP&L uses is often called a "cost reporting system." The cost portfolio contains cost reporting information that is consistent with that seen in the industry at large. The cost portfolio is a summary level document, and it tracks all of the costs on the Project. The cost portfolio identifies major line items of work being done by the Iatan Project's various contractors and vendors. The information that KCP&L tracks in the cost portfolio is regularly updated to reflect actual costs and awarded costs, approved change orders, and commitments. It also has a section that is allocated to the

current cost reforecast. Viewed against what one would expect to see in the industry at large, the KCP&L cost portfolio contains the type of information that industry management generally uses and considers relevant for projects such as the Iatan Project.

Q: Are you familiar with KCP&L's Cost Control System (Schedule SJ2010-1)?

A: Yes. I assisted with portions of its preparation.

Q: Does KCP&L's Cost Control System conform to controls systems that are generally seen and used in the industry?

A: Yes.

Q: Is the cost portfolio in general conformance with KCP&L's cost control system document that was prepared in July 2006?

A: Yes.

Q: Do you believe that the cost portfolio provides senior management with enough information upon which to make reasonable decisions relative to the Iatan Project?

A: Yes. With the types of decisions that KCP&L's senior management is making, the necessary information is available.

Q: Are you aware of the method that the Project Team has used for informing the MPSC Staff of the cost of the Iatan Unit 2 Project?

A: I have a general understanding that on a quarterly basis, KCP&L provides a written report to the MPSC Staff which it includes an exhibit containing a snapshot of the Project's costs and I have seen such reports. This cost exhibit is consistent with the documentation that I see on a regular basis as I track costs on the Iatan Project. I also believe that the same or similar information is made available to KCP&L's joint owners for their monthly review of the Project's costs, as well as the Kansas Commission Staff.

Q: What other information was provided to the MPSC Staff on a quarterly basis relative to costs?

A: To my knowledge, the MPSC Staff also receives summary-level reports from the cost portfolio, as well as textual descriptions of events that bear on the Iatan Project's costs.

BALANCE OF PLANT CONTRACTING METHOD

Q: How would you define Balance of Plant work in the context of the Iatan Project?

A: On Unit 2, the Balance of Plant work, in essence, would be all work exclusive of the Unit 2 work contained in ALSTOM's contract for the boiler and Air Quality Control Systems ("AQCS").

Q: What is a multi-prime contracting format?

A: A multi-prime contract format involves an owner retaining several separate contractors to perform various portions of the work. The owner either functions as the manager of the entire project or hires another third party to do so. If the owner acts as the construction manager, the owner is responsible for all the coordination and has general management responsibilities associated with the entire site and all of the individual prime contractors.

Q: Are there certain risks that are inherent to multi-prime contracting?

A: Yes. Under such a model, the risk of coordination and construction management fall solely on the owner.

Q: In your opinion, in a multi-prime project where the owner acts as the construction manager, what is the likelihood that productivity issues could affect ultimate project costs and schedule?

A: Based on my industry experience which includes dispute review board assignments of about $15 billion in construction work, it is more likely that productivity issues could

affect the project costs and schedule under a multi-prime contract than where there is a single general contractor for several reasons. On a multi-prime site, there are many competing contractors each using the same local labor pool, and those entities do not have to answer to one another. They are independent, they are not always consistent regarding how each entity addresses compensation, safety and scheduling, and this could result in a potential labor problem on the job. If there is a labor productivity issue on the project, a multi-prime site arrangement increases the risk because the project is subject to the vagaries of multiple parties' individual interests and techniques in regard to labor management and the like. Nevertheless, an owner can control a multi-prime project through effective project management.

Q: Was KCP&L's senior management aware of these risks at the outset of the Iatan Unit 2 Project?

A: Yes. After I began work on the Iatan Unit 2 Project in early 2006, I was involved with Schiff in discussions with KCP&L's Senior Management regarding potential contracting methods for the Balance of Plant work that included the potential risks of a multi-prime model, as well as other options that were available. In addition to the concerns discussed above, Schiff raised as an issue KCP&L's ability to assemble an adequate management staff to execute the Iatan Project in a multi-prime setting. Because KCP&L had been out of the power plant construction business for a long time, it did not have an experienced staff. Schiff discussed how difficult it would be for KCP&L to assemble an adequate management staff.

Q: Was part of the contingency in the original CBE developed to account for the risk of KCP&L managing a multi-prime work site itself?

A: Yes, that risk element was considered and included. Company witness Brent Davis testifies to the process that was used for development of the CBE's contingency.

KIEWIT PROPOSAL FOR BALANCE OF PLANT WORK

Q: At what point did KCP&L become aware of Kiewit Power Constructors Co.'s interest in the Iatan Project?

A: My understanding is that Kiewit unexpectedly contacted KCP&L in December 2006 regarding the Balance of Plant work for the Iatan Project.

Q: In what way was Kiewit's contact unexpected?

A: As Company witness Steven Jones testifies, in the spring of 2006, KCP&L surveyed the Balance of Plant construction market and determined that there was essentially no interest in the Iatan Unit 2 Project. The contractors with the ability to handle the Balance of Plant work had sufficient work backlogs, and those companies who perform such work were very busy in executing that work. Thus, they had little or no interest in bidding the Iatan work. KCP&L's market survey included Kiewit, whose potential interest in the Project was very limited. Accordingly, when Kiewit approached KCP&L in December 2006, for the above reasons it was rather unexpected.

Q: Who were Kiewit's competitors in the utility construction industry?

A: Kiewit's competition includes Bechtel, URS/Washington Group, Shaw Stone and Webster, Fluor, and Black & Veatch. There are other, smaller entities who perform work similar to that of Kiewit though the above mentioned are entities that have the core competence to perform Balance of Plant on projects as large as Iatan Unit 2.

Q: Do you know why KCP&L chose not to bid the Balance of Plant work in early 2007?

A: Company witnesses William Downey and Steven Jones testify that KCP&L tried to find bidders, but the potential contractors declined interest just as they had during the previous market survey. More importantly, because KCP&L's strategy had been to perform the Balance of Plant work on a multi-prime basis, the bid documents necessary for procuring a full bid of the remaining Balance of Plant work had not been prepared. Therefore, additional time would have been required to prepare the drawings, prepare the specifications, issue a Request for Proposal, evaluate the bids, and award the Balance of Plant work. Based on my experience and knowledge of the design effort on the Iatan Unit 2 Project at that time, I believe the additional time required to competitively bid the Balance of Plant work on a Design-Bid-Build basis would have necessitated approximately 10 to 12 months.

Q: Had KCP&L chosen to competitively bid the Balance of Plant work at an earlier time, could significant amounts of time have been saved?

A: No, I don't think so. Engineering work takes time, and there is little that can be done to significantly compress it. Also, KCP&L was in the process of continually gathering market information. In late 2006, as I testified to earlier, the entire construction market was overheated. One of the results of an overheated construction market is that companies build a large backlog of work, and this was certainly the case during the 2005 to 2007 time frame. KCP&L knew that it would be in a very thin market, and had it incurred the expense in an attempt to jump start the engineering for the Balance of Plant, it would have suffered on other fronts including a shortage of bidders and a potentially

decreased quality of the engineering product resulting from design compression.

Q: Prior to its involvement with the Iatan Project, were you familiar with Kiewit and its subsidiaries?

A: Yes. Kiewit is a midwestern-based company that is well known nationally and internationally within the construction industry.

Q: What is your opinion of Kiewit?

A: Kiewit is a very good company with a solid reputation. I have served on dispute review boards on other Kiewit projects and Kiewit is a very competent contractor with considerable organizational depth.

Q: Do you know why Kiewit was suddenly interested in the work on the Iatan Project?

A: It is my understanding from discussions with Company witness Brent Davis that Kiewit told KCP&L it had another powerhouse project that had been placed on hold, and the Iatan Project's timing was such that Kiewit saw it as an opportunity to put that crew to work. Company witness Brent Davis' testimony describes the initial discussions with representatives from Kiewit at this time.

Q: At that time, what work was under contract for Balance of Plant for the Iatan Project?

A: The foundation and substructures and various general site work contracts, as well as much of the engineered materials and other commodities that had been purchased as of that time.

Q: Do you recall what Kiewit proposed for the Iatan Project?

A: On April 13, 2006, Kiewit submitted a price for work on both Iatan Unit 1 and Iatan Unit 2 to KCP&L in the amount of about **[redacted]

[redacted] ** for the Balance of Plant construction work for both Iatan units.

Q: What presentations did Kiewit make to KCP&L senior management?

A: Kiewit made a series of presentations. As I recall, the first one was on April 16, 2007 to members of the KCP&L Executive Oversight Committee, the Project management team from the Iatan Unit 2 Project, and Schiff. There were subsequent presentations by Kiewit to smaller groups of individuals after that time.

Q: What was done to validate the estimate that Kiewit provided on April 13, 2007?

A: After Kiewit submitted its initial price in April 2007, KCP&L, with help from Schiff, began a vetting and estimate review process that continued through September 2007. During this time, Kiewit was on the Project site performing walk-downs, and its team developed independent quantity estimates and continually refined its estimate. One beneficial aspect of Kiewit's proposal was that Kiewit performed internal cost estimates using its different internal operating groups. As a result, KCP&L felt it was receiving the benefit of competitive and check estimates provided by those different operating groups.

Q: What risks did Kiewit identify with the Iatan Project in its initial proposal?

A: Kiewit identified labor productivity, labor availability, schedule, and work quantities as major risks. One labor risk, in particular, that Kiewit identified was the potential of what we called a "CB4 effect" on the Iatan Project.

Q: What is "CB4"?

A: CB4 refers to the Council Bluffs Unit 4 project that was built in Council Bluffs, Iowa that

had a significant labor overrun.

Q: How did Kiewit's participation in the Iatan Project offset some of the labor risks that were being considered in early 2007?

A: Kiewit's presence was able to offset or at least compensate for some of the things that Schumacher had pointed out in his report (Schedule DFM2010-5). Some of Schumacher's "best practices" are the very things that Kiewit is known for and for which it has a demonstrated track record in the industry, including: (1) detailed planning and scheduling—in Kiewit's specific proposal for the Iatan Project, discussed at length the process it undertakes using "work packs" and daily work scripts for craft to maximize productivity; (2) minimizing engineering changes—Kiewit's plan for the Iatan Project included measures to ensure that engineering drawings were done timely and correctly; and (3) Kiewit's ability to manage and get along with craft labor. Nationwide, Kiewit probably employs in excess of 60,000 craft people, so Kiewit is a significant labor market player. The unions know Kiewit, and Kiewit knows the unions. So in regard to handling some of the issues looming at Iatan, Kiewit seemed to be a solution for mitigating the labor risks described in Schumacher's labor study.

Q: How did KCP&L vet Kiewit's estimate?

A: One of the goals in vetting the Kiewit estimate was to reconcile Kiewit's price with KCP&L's budget for the Balance of Plant work. As I indicated earlier, one of the reasons for doing this was to confirm KCP&L's budget and the assumptions (i.e., quantities) behind the budget estimate.

There were several meetings with Kiewit regarding all aspects of its estimate. Considerable focus was placed on the issue of work quantities based on the level of

design completion at the time, and KCP&L had a series of meetings with Kiewit to reconcile the quantities that Kiewit had carried in its Iatan estimate with: (1) Kiewit's historical experience on other projects as factored into the quantities that were used at Iatan; and (2) the quantity information that KCP&L had received from Burns & McDonnell. KCP&L expended a great deal of effort over many months to get quantities vetted, reconciled and generally to the point that there was confidence in Kiewit's estimate, based upon the current project status.

Q: What was the result of the vetting of Kiewit's estimate?

A: KCP&L and Kiewit came to a mutual understanding and agreement on most of the quantity issues. As a further result of the vetting process, Kiewit adjusted its original proposal of ** [redacted] ** and ultimately estimated the cost of the known balance of plant work at about ** [redacted] ** for both Unit 1 and Unit 2. The Unit 2 portion of Kiewit's base contract was ** [redacted] ** It is important to note that during this vetting process, for practical evaluation reasons, Kiewit, Burns & McDonnell, the KCP&L Project Team and Schiff decided to freeze the assumptions surrounding Kiewit's original estimate of April 2007 and did not attempt to include any further project definition or design work that was ongoing concurrent to the vetting process.

Q: Why was the estimate frozen?

A: It would have been too difficult to simultaneously vet the original assumptions and incorporate ongoing changes. Instead, the contract was structured to incorporate the effect of any changes as the design work was completed.

Q: What is the compensation structure in the contract between KCP&L and Kiewit?

A: The form of the Kiewit agreement is, in essence, a unit price contract. Kiewit took the

risk except for quantity variations and labor availability. An important issue to KCP&L was that Kiewit took the productivity risk for the scope that was known at that time.

Q: How did Kiewit's price compare the KCP&L's budget for the balance of plant work?

A: Kiewit's price, which was tendered in April 2007, was roughly **[redacted]** for the uncontracted Balance of Plant work. However, by contracting with Kiewit as the general contractor for the Balance of Plant work, KCP&L was able to mitigate other risks that were being carried in the contingency based upon the multi-prime contracting methodology originally planned for the Balance of Plant work.

Q: What was the value of the risks mitigated by Kiewit?

A: Based upon an analysis of the contingency performed during the vetting of the Kiewit estimate, the portion of the contingency in the CBE of December 2006 reserved for certain risks mitigated by Kiewit was valued at **[redacted]** for the Iatan Project (Units 1 and 2). That more than balanced out the difference between Kiewit's price and KCP&L's budgeted amount. There were also other potential savings that could be realized when comparing the CBE to the Kiewit estimate, including: (1) Kiewit had a different methodology of performing the barge facility work than what was embedded in the CBE; (2) KCP&L would be able to reduce its internal management expenses by approximately **[redacted]** from the staffing level necessary to manage a multi-prime; and (3) Kiewit had tendered some value engineering concepts for other scopes that had the potential of saving approximately **[redacted]**

Q: What was Schiff's assessment of the value of the Kiewit proposal for the Iatan Project?

A: ** [redacted] ** Schiff's view was shaped by: (1) Kiewit's demonstrated track record and expertise in the industry; (2) Kiewit had a project management team available who was ready to hit the ground running; (3) Kiewit also had a track record of working with Burns & McDonnell on other projects; (4) Kiewit's plan to co-locate with Burns & McDonnell provided an opportunity to perform constructability reviews as engineering was being prepared; (5) Kiewit is known throughout the industry as having good safety and quality programs, both of which result in lower project cost; (6) Kiewit had management expertise that would likely optimize schedule achievement.

Q: Did KCP&L have any meaningful options to bid the Kiewit portion of the Balance of Plant work?

A: No. As stated, KCP&L did not have the time to stop the work and subject the Balance of Plant scope to competitive bidding. As important, there was no known competition for Kiewit at that time. In my view, the vetting process in which KCP&L and Kiewit engaged was a reasonably suitable substitute for competitively bidding the work given overall project conditions and is often used in the industry.

Q: Did KCP&L's senior management agree to contract with Kiewit based on its final proposal and estimate?

A: Yes.

Q: Was an estimate at completion for Kiewit's work on the Iatan Unit 2 Project part of the 2010 Cost Reforecast?

A: Yes.

Q: When you analyzed that portion of the 2009 Cost Reforecast, what did you find?

A: ** [redacted] ** The overall cost estimated in May 2008 for Kiewit totaled ** [redacted] ** This projection is consistent with the project team's current revised EAC for Kiewit in the 2010 Cost Reforecast.

Q: Based on your analysis of the evolution of the Iatan Unit 2 Project's estimates, do you believe that Kiewit's contract amount on the Iatan Unit 2 Project has grown due to mismanagement by KCP&L?

A: No. I believe that the major sources of growth in the Kiewit contract have resulted from design maturation of the Balance of Plant work and the associated impacts of the same on the schedule for the Iatan Unit 2 Project as well as changes in pricing from an overheated market.

Q: Does that conclude your testimony?

A: Yes.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Kansas City Power & Light Company to Modify Its Tariffs to Continue the Implementation of Its Regulatory Plan	)))	Docket No. ER-2010-____

AFFIDAVIT OF DANIEL F. MEYER

STATE OF ILLINOIS)
) **ss**
COUNTY OF COOK)

Daniel F. Meyer, being first duly sworn on his oath, states:

1. My name is Daniel F. Meyer. I am employed by Meyer Construction Consulting, Inc. My services have been retained by Schiff Hardin LLP, who is a consultant for Kansas City Power & Light Company.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Kansas City Power & Light Company consisting of forty-eight (48) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

Daniel F. Meyer

Subscribed and sworn before me this 20th day of May, 2010.

Notary Public

My commission expires: July 28, 2013

STEPHANIE KAY MCCORKLE
Notary Public - Notary Seal
State of Missouri
Commissioned for Clay County
My Commission Expires: July 28, 2013
Commission Number: 09451858

aace International

AACE International Recommended Practice No. 10S-90

COST ENGINEERING TERMINOLOGY

Recommended Practice No. 10S-90

Cost Engineering Terminology

April 13, 2004

Unless otherwise noted, all terms contained in this document have been developed by various AACE International technical committees, special interest groups, or project teams. All terms have completed a thorough review process, followed by approval by the AACE International Technical Board. Portions of this document have been incorporated into the American National Standards Institute's (ANSI) Standard No. Z94.x.

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[B] Based in part upon ASTM Standard No. E833 with modifications

[D] Department of Defense

[P] PMI Representative

(mm/yy) Indicates date adopted

ACCELERATION - conduct by the owner or the engineer (either in a directed or constructive manner) in which a contractor is required to complete performance of the contracted scope of work earlier than scheduled. A Directed Acceleration occurs when the owner formally directs such accelerated completion. A Constructive Acceleration generally occurs when a contractor is entitled to an excusable delay; the contractor requests a time extension from the owner; the owner declines to grant a time extension or grants one in an untimely manner; the owner or the engineer either expressly orders completion within the original performance period or implies in a clear manner that timely completion within the original performance period is expected; and the contractor gives notice to the owner or the engineer that the contractor considers this action an acceleration order. (11/90)

ACCEPTANCE, FINAL (PARTIAL) - the formal action by the owner accepting the work (or a specified part thereof), following written notice from the engineer that the work (or specified part thereof) has been completed and is acceptable subject to the provisions of the contract regarding acceptance. (11/90)

ACCESS TO THE WORK - the right of the contractor to ingress and egress, and to occupy the work site as required to reasonably perform the work described in the contract documents. An example of denial of access to the work would be on the segment of a sewer installation project where no easements or work limits are indicated, but the contractor is ordered, after contract award, to conduct operations within a narrow work corridor necessitating different or unanticipated construction methods (e.g., use of sheeting). (11/90)

ACCOUNTABILITY - answerable, but not necessarily charged personally with doing the work. Accountability cannot be delegated but it can be shared. (11/90)

ACCOUNT CODE STRUCTURE - the system used to assign summary numbers to elements of the work breakdown and account numbers to individual work packages. (11/90)

ACCOUNT NUMBER - a numeric identification of a work package. An account number may be assigned to one or more activities. Syn.: SHOP ORDER NUMBER. (11/90)

ACCOUNTS PAYABLE - the value of goods and services rendered on which payment has not yet been made. See also TAXES PAYABLE. (11/90)

ACCOUNTS RECEIVABLE - the value of goods shipped or services rendered to a customer on which payment has not yet been received. Usually includes an allowance for bad debts. (11/90)

ACTIVITY - An operation or process consuming time and possibly resources. An activity is an element of work that must be performed in order to complete a project. An activity consumes time, and may have resources associated with it. Activities must be measurable and controllable. An activity may include one or more tasks. See also TASK. (3/04)

ACTIVITY CODE - any combination of letters, numbers, or blanks which describes and identifies any activity or task shown on the schedule. Syn.: ACTIVITY IDENTIFIER. (11/90)

ACTIVITY DESCRIPTION - a concise explanation of the nature and scope of the work to be performed, which easily identifies an activity to any recipient of the schedule. (11/90)

ACTIVITY DURATION - the length of time from start to finish of an activity, estimated or actual, in working or calendar time units. (11/90)

ACTIVITY IDENTIFIER - see ACTIVITY CODE. (11/90)

ACTIVITY SPLITTING - dividing (i.e., splitting) an activity of stated scope, description and schedule into two or more activities which are rescoped and rescheduled. The sum of the split activities is normally the total of the original. (11/90)

ACTIVITY TIMES - time information generated through the CPM calculation that identifies the start and finish times for each activity in the network. (11/90)

ACTIVITY TOTAL SLACK - the latest allowable end time minus earliest allowable end time. The activity slack is always greater than or equal to the slack of the activity ending event. (11/90)

ACTS OF GOD - (1) an extraordinary interruption by a natural cause, as a flood or earthquake, or the usual course of events that experience, foresight or care cannot reasonably foresee or prevent; (2) an event in nature over which neither the owner nor the contractor has any control. (11/90)

ACTUAL COMPLETION DATE - the calendar date on which an activity was completed. See ACTUAL FINISH DATE. (11/90)

ACTUAL COSTS - the actual expenditures incurred by a program or project. (11/90)

ACTUAL COST OF WORK PERFORMED (ACWP) - the direct costs actually incurred and the direct costs actually recorded and assigned in accomplishing the work performed. These costs should reconcile with the contractor's incurred cost ledgers when they are audited by the client. (11/90)

ACTUAL FINISH DATE - the calendar date on which the activity was actually completed. It must be prior to or equal to the data date. The remaining duration of this activity is zero. (11/90)

ACTUAL START DATE - the calendar date on which work actually began on an activity. (11/90)

ADDENDA - written or graphic instruments issued prior to the date for opening of bids which may interpret or modify the bidding documents by additions, deletions, clarification, or corrections. (11/90)

ADJUSTED INTERNAL RATE-OF-RETURN (AIRR) - the compound rate of interest that, when used to discount the terminal values of costs and benefits of a project over a given study period, will make the costs equal the benefits when cash flows are reinvested at a specified rate. [A] (11/90)

ADM - see ARROW DIAGRAMMING METHOD. (11/90)

ADMINISTRATIVE EXPENSE - the overhead cost due to the nonprofit-specific operations of a company. Generally includes top management salaries and the costs of legal, central purchasing, traffic, accounting, and other staff functions and their expenses for travel and accommodations. (11/90)

AGENT - a person authorized to represent another (the principal) in some capacity. The agent can only act within this capacity or "scope of authority" to bind the principal. Agency agreements can be oral or in writing. (11/90)

AGGREGATE - a collection of items arbitrarily brought together as associated variables for analytical or comparative purposes. (11/90)

AGREEMENT - the written agreement between the owner and the contractor covering the work to be performed; other contract documents are attached to the agreement and made a part thereof as provided therein. (11/90)

ALLOWANCES - additional resources included in estimates to cover the cost of known but undefined requirements for an individual activity, work item, account or subaccount. (11/90)

AMBIGUITY - an uncertainty in the meaning of provisions of a contract, document or specification. Mere disagreement about the meaning of a provision does not indicate an ambiguity. There must be genuine uncertainty of meaning based on logical interpretation of the language used in the contract. Generally, ambiguities in contracts are construed against the drafter of the agreement. (11/90)

AMENDMENT - a modification of the contract by a subsequent agreement. This does not change the entire existing contract but does alter the terms of the affected provisions or requirements. (11/90)

AMORTIZATION - (1) as applied to a capitalized asset, the distribution of the initial cost by periodic charges to operations as in depreciation. Most properly applies to assets with indefinite life; (2) the reduction of a debt by either periodic or irregular payments; (3) a plan to pay off a financial obligation according to some prearranged schedule. (11/90)

ANALYSIS - the examination of a complex whole and the separation and identification of its constituent parts and their relationships. (11/90)

ANNUAL VALUE - a uniform annual amount equivalent to the project costs or benefits taking into account the time value of money throughout the study period. Syn.: ANNUAL WORTH; EQUIVALENT UNIFORM ANNUAL VALUE. See AVERAGE ANNUAL COST. [A] (11/90)

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

ANNUALLY RECURRING COSTS - those costs that are incurred in a regular pattern each year throughout the study period. [A] (11/90)

ANNUITY - (1) an amount of money payable to a beneficiary at regular intervals for a prescribed period of time out of a fund reserved for that purpose; (2) a series of equal payments occurring at equal periods of time. (11/90)

ANTICIPATORY BREACH - a specific refusal by the contractor to perform within the terms of the contract documents before performance is due; or a clear indication that the contractor is unable or unwilling to perform. (11/90)

APPLICATION FOR PAYMENT - the form furnished by the owner or the engineer which is to be used by the contractor in requesting progress or final payments and which shall contain an affidavit, if required, in the general or supplementary conditions. The application for payment includes all supporting documentation as required by the contract documents. (11/90)

APPROVE - to accept as technically satisfactory by person or persons in authority. The approval may still require confirmation by someone else at a higher level of authority for legal or commercial considerations. (11/90)

ARBITRATION - a method for the resolution of disputes by an informal tribunal in which a neutral person or persons with specialized knowledge in the field in question renders a decision on the dispute. An arbitrator may grant any award which is deemed to be just and equitable after having afforded each party full and equal opportunity for the presentation of the case. Arbitration does not strictly follow the rules of evidence and discovery procedures found in litigation. Arbitration may be conducted under the auspices of an organization (eg, the American Arbitration Association) which is available as a vehicle for conducting an arbitration. (11/90)

ARROW - The graphic representation of an activity in the ADM network. One arrow represents one activity. The tail of the arrow represents the start of the activity. The head of the arrow represents the finish. The arrow is not a vector quantity and is not drawn to scale. It is uniquely defined by two events. (3/04)

ARROW DIAGRAM - a network (logic diagram) on which the activities are represented by arrows between event nodes. (11/90)

ARROW DIAGRAMMING METHOD (ADM) - a method of constructing a logical network of activities using arrows to represent the activities and connecting them head to tail. This diagramming method shows the sequence, predecessor and successor relationships of the activities. (11/90)

AS-BUILT SCHEDULE - the final project timetable, which depicts for each activity actual start and completion date, actual duration, costs, and consumed resources. (11/90)

ASSESSED VALUE - that value entered on the official assessor's records as the value of the property applicable in determining the amount of taxes to be assessed against that property. (11/90)

AUTHORIZED WORK - activity that has been approved to proceed by the client. The scope may or may not be well defined at the time authorized; it is usually defined by contract. (11/90)

AVERAGE ANNUAL COST - the conversion, by an interest rate and present worth technique, of all capital and operating costs to a series of equivalent equal annual costs. As a system for comparing proposal investments, it requires assumption of a specific minimum acceptable interest rate. (11/90)

AVERAGE-INTEREST METHOD - a method of computing required return on investment based on the average book value of the asset during its life or during a specified study period. (11/90)

BACKCHARGE - a cost caused by defective or deficient work by the contractor deducted from or used to offset the amount due to the contractor. (11/90)

BACKUP - supporting documents for an estimate or schedule including detailed calculations, descriptions of data sources, and comments on the quality of the data. (11/90)

BACKWARD PASS - calculation of the latest finish time and latest start time for all uncompleted network activities or late time for events in the ADM and PDM methods. It is determined by working from the final activity and subtracting durations from uncompleted activities. (11/90)

BAR CHART - a graphic presentation of project activities shown by a time-scaled bar line. Syn.: GANTT CHART. (11/90)

BASE DATE - see BASE TIME. [A] (11/90)

BASE PERIOD (OF A GIVEN PRICE INDEX) - period for which prices serve as a reference for current period prices; in other words, the period for which an index is defined as 100 (if expressed in percentage form) or as 1 (if expressed in ratio form). (11/90)

BASE POINT FOR ESCALATION - cost index value for a specific month or an average of several months that is used as a basis for calculating escalation. (11/90)

BASE TIME - the date to which all future and past benefits and costs are converted when a present value method is used (usually the beginning of the study period). Syn.: BASE DATE. [A] (11/90)

BASELINE - In project control, the reference plans in which cost, schedule, scope and other project performance criteria are documented and against which performance measures are assessed and changes noted. (1/03)

BASIS - Documentation that describes how an estimate, schedule, or other plan component was developed and defines the information used in support of development. A basis document commonly includes, but is not limited to, a description of the scope included, methodologies used, references and defining deliverables used, assumptions and exclusions made, clarifications, adjustments, and some indication of the level of uncertainty. (1/03)

BATTERY LIMIT - comprises one or more geographic boundaries, imaginary or real, enclosing a plant or unit being engineered and/or erected, established for the purpose of providing a means of specifically identifying certain portions of the plant, related groups of equipment, or associated facilities. It generally refers to the processing area and includes all the process equipment, and excludes such other facilities as storage, utilities, administration buildings, or auxiliary facilities. The scope included within a battery limit must be well-defined so that all personnel will clearly understand it. See also OFF-SITES. (11/90)

BAYESIAN INFERENCE - a statistical tool for causal analysis and dependency of events. (11/90)

BEGINNING EVENT - an event that signifies the beginning of an activity. Syn.: PREDECESSOR EVENT; PRECEDING EVENT; STARTING EVENT. (11/90)

BEGINNING NETWORK EVENT - the event that signifies the beginning of a network (or subnet). (11/90)

BEGINNING (START) NODE OF NETWORK - (ADM) a node at which no activities end, but one or more activities begin. (11/90)

BENCHMARK INDEXES - for most manufacturing and all mining industries, indexes reflecting changes in output between census years. (11/90)

BENCHMARKING - A measurement and analysis process that compares practices, processes, and relevant measures to those of a selected basis of comparison (i.e., the benchmark) with the goal of improving performance. The comparison basis includes internal or external competitive or best practices, processes or measures. Examples of measures include estimated costs, actual costs, schedule durations, resource quantities and so on. (1/03)

BENEFICIAL OCCUPANCY - use of a building, structure, or facility by the owner for its intended purpose (functionally complete), although other contract work, nonessential to the function of the occupied section, remains to be completed. See also SUBSTANTIAL COMPLETION. (11/90)

BENEFIT COST ANALYSIS - a method of evaluating projects or investments by comparing the present value or annual value of expected benefits to the present value or annual value of expected costs. [A] (11/90)

BENEFIT-TO-COST RATIO (BCR) - benefits divided by costs, where both are discounted to a present value or equivalent uniform annual value. [A] (11/90)

BID - to submit a price for services; a proposition either verbal or written, for doing work and for supplying materials and/or equipment. (11/90)

BID BOND - a bond that guarantees the bidder will enter into a contract on the basis of his/her bond. (11/90)

BIDDER - the individual, partnership, or corporation, or combination thereof, acting directly or through an authorized representative, formally submitting a bid directly to the owner, as distinct from a sub-bidder, who submits a bid to a bidder. (11/90)

BID SECURITY - security is provided in connection with the submittal of a bid to guarantee that the bidder, if awarded or offered the contract, will execute the contract and perform the work. The requirements for the bid security are usually designated in a specific section of the bidding documents. The bid security is payable to the owner (usually around 5% of the total bid price) in the form of either a certified or bank check or a bid bond issued by a surety satisfactory to the owner. The bid security of the successful bidder is usually retained until the bidder has executed the agreement and furnished the required contract security, whereupon the bid security is returned. Bid security of the other bidders is returned after the bid opening. (11/90)

BID SHOPPING - an effort by a prime contractor to reduce the prices quoted by subcontractors and/or suppliers, by providing the bid price to other subcontractors or suppliers in an attempt to get the other subcontractors or suppliers to underbid the original price quoted. The reverse of this situation is when subcontractors try to get a better price out of a prime contractor. This is known as Bid Peddling. (11/90)

BIDDING DOCUMENTS - the advertisement for bids, instructions to bidders, information available to bidders, bid form with all attachments, and proposed contract documents (including all addenda issued prior to receipt of bids). (11/90)

BIDDING REQUIREMENTS - the advertisement for bids, instructions to bidders, supplementary instructions and all attachments therein, information to bidders and all attachments therein, and bid form and all attachments therein. (11/90)

BLACK BOX - describes a system (organism or mechanism) whose structure is unknown either because it cannot be observed or it is proprietary, classified or too complex to be understood. (11/90)

BLANKET BOND - a bond covering a group of persons, articles, or properties. (11/90)

BLOCK DIAGRAM - a diagram made up of vertically placed rectangles situated adjacent to each other on a common base line. Where the characteristic to be depicted is quantitative, the height of the rectangles is usually taken to be proportional to this quantitative variable. When this kind of diagram is used to portray a frequency distribution it takes the name of histogram. (11/90)

B.L.S. -Bureau of Labor Statistics. (11/90)

B.L.S. PERIODICALS–

- **CPI Detailed Report**, issued monthly
- **Current Wage Developments**, issued monthly
- **Employment and Earnings**, issued monthly
- **Monthly Labor Review**, issued monthly
- **Occupational Outlook Quarterly**, issued quarterly
- **Producers' Prices and Price Indexes**, issued monthly (previously **Wholesale Price Index**) (11/90)

BONDS - instruments of security furnished by the contractor and/or surety in accordance with the contract documents. The term contract security refers to the payment bond, performance bond and those other instruments of security required in the contract documents. (11/90)

BOND, BID - a bond that is executed in connection with the submittal of a bid and which guarantees that the bidder, if awarded or offered the contract, will execute the contract and perform the work. The bidding documents sometimes include a specific form for submittal of the bid bond and may be used to satisfy the requirement for bid security as defined in the bidding documents. (11/90)

BOND, PAYMENT - a bond that is executed in connection with a contract and which secures the payment of all persons supplying labor and material in the prosecution of the work provided for in the contract. (11/90)

BOND PERFORMANCE - a bond that is executed in connection with a contract and which secures the performance and fulfillment of all the undertakings, covenants, terms, conditions, and agreements contained in the contract. (11/90)

BONUS-PENALTY - a contractual arrangement between a client and a contractor wherein the contractor is provided a bonus, usually a fixed sum of money, for each day the project is completed ahead of a specified schedule and/or below a specified cost, and agrees to pay a similar penalty for each day of completion after the schedule date or over a specified cost up to a specified maximum either way. The penalty situation is sometimes referred to as liquidated damages. (11/90)

BOOK VALUE (NET) - (1) current investment value on the books calculated as original value less depreciated accruals; (2) new asset value for accounting use; (3) the value of an outstanding share of stock of a corporation at any one time, determined by the number of shares of that class outstanding. (11/90)

BREACH OF CONTRACT - failure, by either the owner or the contractor, without legal excuse, to perform any work or duty owed to the other person. (11/90)

BREAKEVEN CHART - a graphic representation of the relation between total income and total costs for various levels of production and sales indicating areas of profit and loss. (11/90)

BREAKEVEN POINT - (1) in business operations, the rate of operations output, or sales at which income is sufficient to equal operating costs or operating cost plus additional obligations that may be specified; (2) the operating condition, such as output, at which two alternatives are equal in economy; (3) the percentage of capacity operation of a manufacturing plant at which income will just cover expenses. (11/90)

BREAKOUT SCHEDULE - this jobsite schedule, generally in bar chart form is used to communicate the day-to-day activities to all working levels on the project as directed by the construction manager. Detail information with regard to equipment use, bulk material requirements, and craft skills distribution, as well as the work to be accomplished, forms the content of this schedule. The schedule is issued on a weekly basis with a two to three-week look ahead from the issue date. This schedule generally contains from 25 to 100 activities. (11/91)

BUDGET - a planned allocation of resources. The planned cost of needed materials is usually subdivided into quantity required and unit cost. The planned cost of labor is usually subdivided into the workhours required and the wage rate (plus fringe benefits and taxes). (11/90)

BUDGET COST OF WORK PERFORMED (BCWP) - the sum of the budgets for completed portions of in-process work, plus the appropriate portion of the budget for level of effort and apportioned effort for the relevant time period BCWP is commonly referred to as "earned value". (11/90)

BUDGET COST OF WORK SCHEDULED (BCWS) - the sum of the budgets for work scheduled to be accomplished (including work-in- process), plus the appropriate portion of the budgets for level of effort and apportioned effort for the relevant time period. (11/90)

BUDGETING - A process used to allocate the estimated cost of resources into cost accounts (i.e., the cost budget) against which cost performance will be measured and assessed. Budgeting often considers time-phasing in relation to a schedule and/or time-based financial requirements and constraints. (1/03)

BULK MATERIAL - material bought in lots. These items can be purchased from a standard catalog description and are bought in quantity for distribution as required. Examples are pipe (nonspooled), conduit, fittings, and wire. (11/90)

BURDEN - in construction, the cost of maintaining an office with staff other than operating personnel. Includes also federal, state and local taxes, fringe benefits and other union contract obligations. In manufacturing, burden sometimes denotes overhead. (11/90)

BURDEN OF PROOF - The necessity of proving the facts in a dispute on an issue raised between the owner and the contractor. In a claim situation, the burden of proof is always on the person filing the claim. This is true whether the contractor is claiming against the owner, or the owner is making a claim against the contractor. (11/90)

BUSINESS PLANNING - the determination of financial, production and sales goals of a business organization; and the identification of resources, methods, and procedures required to achieve the established objectives within specified budgets and timetables. (11/90)

CALENDAR - time schedule of project activities. The calendar identifies working days, holidays, and the length of the working day in time units and/or shifts. (11/90)

CALENDAR RANGE - the span of the calendar from the calendar start date through the calendar end date. The calendar start date is unit number one. The calendar range is usually expressed in years. (11/90)

CALENDAR UNIT - the smallest time unit of the calendar that is in use to estimate activity duration. This unit is generally in hours, shifts, days, or weeks. Syn.: TIME UNIT. (11/90)

CALENDAR START DATE - the date assigned to the first unit of the defined calendar; the first day of the schedule. (11/90)

CAPACITY FACTOR - (1) the ratio of average load to maximum capacity; (2) the ratio between average load and the rated capacity of the apparatus; (3) the ratio of the average actual use to the rated available capacity. Also called Capacity Utilization Factor. (11/90)

CAPITAL BUDGETING - a systematic procedure for classifying, evaluating, and ranking proposed capital expenditures for the purpose of comparison and selection, combined with the analysis of the financing requirements. (11/90)

CAPITAL, DIRECT - see DIRECT COST (1). (11/90)

CAPITAL, FIXED - the total original value of physical facilities which are not carried as a current expense on the books of account and for which depreciation is allowed by the Federal Government. It includes plant equipment, building, furniture and fixtures, and transportation equipment used directly in the production of a product or service. It includes all costs incident to getting the property in place and in operating condition, including legal costs, purchased patents, and paid-up licenses. Land, which is not depreciable, is often included. Characteristically it cannot be converted readily into cash. (11/90)

CAPITAL, INDIRECT - see INDIRECT COST (1). (11/90)

CAPITAL, OPERATING - capital associated with process facilities inside battery limits. (11/90)

CAPITAL RECOVERY - (1) charging periodically to operations amounts that will ultimately equal the amount of capital expenditure (see AMORTIZATION, DEPLETION, AND DEPRECIATION); (2) the replacement of the original cost of an asset plus interest; (3) the process of regaining the net investment in a project by means of revenue in excess of the costs from the project. (Usually implies amortization of principal plus interest on the diminishing unrecovered balance.) (11/90)

CAPITAL RECOVERY FACTOR - a factor used to calculate the sum of money required at the end of each of a series of periods to regain the net investment of a project plus the compounded interest on the unrecovered balance. (11/90)

CAPITAL, SUSTAINING - the fixed capital requirements to (1) maintain the competitive position of a project throughout its commercial life by improving product quality, related services, safety, or economy, or (2) required to replace facilities which wear out before the end of the project life. (11/90)

CAPITAL, TOTAL - sum of fixed and working capital. (11/90)

CAPITAL, VENTURE - capital invested in technology or markets new at least to the particular organization. (11/90)

CAPITAL, WORKING - the funds in addition to fixed capital and land investment which a company must contribute to the project (excluding startup expense) to get the project started and meet subsequent obligations as they come due. Working capital includes inventories, cash and accounts receivable minus accounts payable. Characteristically, these funds can be converted readily into cash. Working capital is normally assumed recovered at the end of the project. (11/90)

CAPITALIZED COST - (1) the present worth of a uniform series of periodic costs that continue for an indefinitely long time (hypothetically infinite); (2) the value at the purchase date of the asset of all expenditures to be made in reference to this asset over an indefinite period of time. This cost can also be regarded as the sum of capital which, if invested in a fund earning a stipulated interest rate, will be sufficient to provide for all payments required to maintain the asset in perpetual service. (11/90)

CASH COSTS - total cost excluding capital and depreciation spent on a regular basis over a period of time, usually one year. Cash costs consist of manufacturing cost and other expenses such as transportation cost, selling expense, research and development cost or corporate administrative expense. (11/90)

CASH FLOW - the net flow of dollars into or out of a project. The algebraic sum, in any time period, of all cash receipts, expenses, and investments. Also called cash proceeds or cash generated. The stream of monetary (dollar) values -- costs and benefits – resulting from a project investment. [A] (11/90)

CASH RETURN, PERCENT OF TOTAL CAPITAL - ratio of average depreciation plus average profit, to total fixed and working capital, for a year of capacity sales. Under certain limited conditions, this figure closely approximates that calculated by profitability index techniques where it is defined as the difference, in any time period, between revenues and all cash expenses, including taxes. (11/90)

CAUSATION - an explanation or description of the facts and circumstances that produce a result, the cause and effect for which the contractor claims entitlement to compensation from the owner under the contract. (11/90)

CHAIN INDEX - an index which globally measures the price change of a range of commodities. (11/90)

CHANGE - alteration or variation to a scope of work and/or the schedule for completing the work. (11/90)

CHANGE, CARDINAL - work that is beyond the scope of that specified in the contract and consequently unauthorized. The basic tests for a cardinal change are whether the type of work was within the contemplation of the parties when they entered into the contract and whether the job as modified is still the same basic job. (11/90)

CHANGE, CONSTRUCTIVE - an act or failure to act by the owner or the engineer that is not a directed change, but which has the effect of requiring the contractor to accomplish work different from that required by the existing contract documents. (11/90)

CHANGE IN SCOPE - a change in objectives (either in quality or quantity of the specifications and/or material), work plan, or schedule that results in a material difference from the terms of an approval to proceed previously granted by higher authority. Under certain conditions (normally so stated in the approval instrument), a change in resource applications may constitute a change in scope. (11/90)

CHANGE ORDER - a document requesting a scope change or correction. It must be approved by both the client and the contractor before it becomes a legal change to the contract. (11/90)

CHANGE, UNILATERAL - see MODIFICATION, UNILATERAL. (11/90)

CHANGE IN SEQUENCE - a change in the order of work initially specified or planned by the contractor. If this change is ordered by the owner and results in additional cost to the contractor, the contractor may be entitled to recovery under the changes clause. (11/90)

CHANGED CONDITIONS - see DIFFERING SITE CONDITIONS. (11/90)

CHART OF ACCOUNTS - see CODE OF ACCOUNTS. (11/90)

CHEBYSHEV'S THEOREM - a statistical method of predicting the probability that a value will occur within one or more standard deviations (±) of the mean. (11/90)

CHEMICAL ENGINEERING PLANT COST INDEX - an index tailor-made specifically for chemical plant construction, composed of many subindexes for the various components of a chemical plant. (11/90)

CLAIM - a written statement requesting additional time and/or money for acts or omissions during the performance of the construction contract. The contract must set forth the facts and circumstances for which the owner or the engineer is responsible to be entitled to additional compensation and/or time. (11/90)

CODE OF ACCOUNTS (COA) - A systematic coding structure for organizing and managing asset, cost, resource, and schedule activity information. A COA is essentially an index to facilitate finding, sorting, compiling, summarizing, and otherwise managing information that the code is tied to. A complete code of accounts includes definitions of the content of each account. Syns.: Chart of Accounts, Cost Codes. (1/03)

COMMITMENTS - the sum of all financial obligations made, including incurred costs and expenditures as well as obligations, which will not be performed until later. (11/90)

COMMODITY - in price index nomenclature, a good and sometimes a service. (11/90)

COMPLETED ACTIVITY - an activity with an actual finish date. (11/90)

COMPOSITE PRICE INDEX - an index which globally measures the price change of a range of commodities. (11/90)

COMPOUND AMOUNT - the future worth of a sum invested (or loaned) at compound interest. (11/90)

COMPOUND AMOUNT FACTOR - (1) the function of interest rate and time that determines the compound amount from a stated initial sum; (2) a factor which when multiplied by the single sum or uniform series of payments will give the future worth at compound interest of such single sum or series. (11/90)

COMPOUND INTEREST - (1) the type of interest that is periodically added to the amount of investment (or loan) so that subsequent interest is based on the cumulative amount; (2) the interest charges under the condition that interest is charged on any previous interest earned in any time period, as well as on the principal. (11/90)

COMPOUNDING, CONTINUOUS - (1) a compound interest situation in which the compounding period is zero and the number of periods infinitely great. A mathematical concept that is practical for dealing with frequent compounding and small interest rates; (2) a mathematical procedure for evaluating compound interest factors based on a continuous interest function rather than discrete interest periods. (11/90)

COMPOUNDING PERIOD - the time interval between dates at which interest is paid and added to the amount of an investment or loan. Designates frequency of compounding. (11/90)

CONCEPTUAL SCHEDULE - a conceptual schedule is similar to a proposal schedule except it is usually time-scaled and is developed from the abstract design of the project. This schedule is used primarily to give the client a general idea of the project scope and an overview of activities. Most conceptual schedules contain between 30 and 200 activities. (11/90)

CONFLICT IN PLANS AND SPECIFICATIONS - statements or meanings in the contract documents (including drawings and specifications) that cannot be reconciled by reasonable interpretation on the part of the contractor and which may require the owner to provide an interpretation between alternatives. (11/90)

CONSENT OF SURETY - an acknowledgement by a surety that its bond, given in connection with a contract, continues to apply to the contract as modified; or, at the end of a contract, permission from the surety to release all retainage to the contractor. (11/90)

CONSTANT BASKET - a set of goods and services with quantities fixed in relation to a given time period, used for computing composite price indexes. (11/90)

CONSTANT BASKET PRICE INDEX - a price index which measures price changes by comparing the expenditures necessary to provide the same set of goods and services at different points in time. (11/90)

CONSTANT DOLLARS - dollars of uniform purchasing power exclusive of general inflation or deflation. Constant dollars are tied to a reference year. [A] (11/90)

CONSTANT UTILITY PRICE INDEX - a composite price index which measures price changes by comparing the expenditures necessary to provide substantially equivalent sets of goods and services at different points in time. (11/90)

CONSTRAINT - an externally imposed factor affecting the scheduling of an activity. The external factor may be a resource, such as labor, cost or equipment, or, it can be a physical event that must be completed prior to the activity being restrained. Syn.: RESTRAINT. (11/90)

CONSTRAINT DATE - see PLUG DATE. (11/90)

CONSTRUCTION COST - the sum of all costs, direct and indirect, inherent in converting a design plan for material and equipment into a project ready for start-up, but not necessarily in production operation; the sum of field labor, supervision, administration, tools, field office expense, materials, and equipment. (11/90)

CONSTRUCTION MANAGEMENT - Project management as applied to construction. (11/90)

CONSUMABLES - supplies and materials used up during construction. Includes utilities, fuels and lubricants, welding supplies, worker's supplies, medical supplies, etc. (11/90)

CONSUMERS PRICE INDEX (CPI) - a measure of time-to-time fluctuations in the price of a quantitatively constant market basket of goods and services, selected as representative of a special level of living. (11/90)

CONTINGENCY - An amount added to an estimate to allow for items, conditions, or events for which the state, occurrence, and/or effect is uncertain and that experience shows will likely result, in aggregate, in

additional costs. Typically estimated using statistical analysis or judgment based on past asset or project experience. Contingency usually excludes; 1) major scope changes such as changes in end product specification, capacities, building sizes, and location of the asset or project (see management reserve), 2) extraordinary events such as major strikes and natural disasters, 3) management reserves, and 4) escalation and currency effects. Some of the items, conditions, or events for which the state, occurrence, and/or effect is uncertain include, but are not limited to, planning and estimating errors and omissions, minor price fluctuations (other than general escalation), design developments and changes within the scope, and variations in market and environmental conditions. Contingency is generally included in most estimates, and is expected to be expended. (1/04)

CONTRACTOR - a business entity that enters into contracts to provide goods or services to another party. (11/90)

CONTRACT COMPLETION DATE - the date established in the contract for completion of all or specified portions of the work. This date may be expressed as a calendar date or as a number of days after the date for commencement of the contract time is issued. (11/90)

CONTRACT DATE - any date specified in the contract or imposed on any project activity or event that impacts the activity/project schedule. Syn.: SCHEDULED DATE. (11/90)

CONTRACT DOCUMENTS - the agreement, addenda (which pertain to the contract documents), contractor's bid (including documentation accompanying the bid and any post-bid documentation submitted prior to the notice of award) when attached as an exhibit to the agreement, the bonds, the general conditions, the supplementary conditions, the specifications and the drawings as the same are more specifically identified in the agreement, together with all amendments, modifications and supplements issued pursuant to the general conditions on or after the effective date of the agreement. (11/90)

CONTRACT PRICE - the monies payable by the owner to the contractor under the contract documents as stated in the agreement. (11/90)

CONTRACT "READ AS A WHOLE" - reading an entire contract document, instead of reading each clause in the contract in isolation. If a clause is ambiguous and can be interpreted in more than one way, the meaning that conforms to the rest of the document is usually the accepted meaning. (11/90)

CONTRACT TIME - the number of days within which, or the dates by which, the work, or any specified part thereof, is to be completed. (11/90)

CONTRACT WORK BREAKDOWN STRUCTURE (CWBS) - see WORK BREAKDOWN STRUCTURE. (11/90)

CONTRACTS - legal agreements between two or more parties, which may be of the types enumerated below:

1. In Cost Plus contracts the contractor agrees to furnish to the client services and material at actual cost, plus an agreed upon fee for these services. This type of contract is employed most often when the scope of services to be provided is not well defined.

    a. Cost Plus Percentage Burden and Fee - the client will pay all costs as defined in the terms of the contract, plus "burden and fee" at a specified percent of the labor costs which the client is

paying for directly. This type of contract generally is used for engineering services. In contracts with some governmental agencies, burden items are included in indirect cost.

b. Cost Plus Fixed Fee - the client pays costs as defined in the contract document. Burden on reimbursable technical labor cost is considered in this case as part of cost. In addition to the costs and burden, the client also pays a fixed amount as the contractor's "fee".

c. Cost Plus Fixed Sum - the client will pay costs defined by contract plus a fixed sum which will cover "non-reimbursable" costs and provide for a fee. This type of contract is used in lieu of a cost plus fixed fee contract where the client wishes to have the contractor assume some of the risk for items which would be Reimbursable under a Cost Plus Fixed Fee type of contract.

d. Cost Plus Percentage Fee - the client pays all costs, plus a percentage for the use of the contractor's organization.

2. Fixed Price types of contract are ones wherein a 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.

a. Lump Sum - contractor agrees to perform all services as specified by the contract for a fixed amount. A variation of this type may include a turn-key arrangement where the contractor guarantees quality, quantity and yield on a process plant or other installation.

b. Unit Price - contractor will be paid at an agreed upon unit rate for services performed. For example, technical work-hours will be paid for at the unit price agreed upon. Often field work is assigned to a subcontractor by the prime contractor on a unit price basis.

c. Guaranteed Maximum (Target Price) - a contractor agrees to perform all services as defined in the contract document guaranteeing that the total cost to the client will not exceed a stipulated maximum figure. Quite often, these types of contracts will contain special share-of-the-saving arrangements to provide incentive to the contractor to minimize costs below the stipulated maximum.

d. Bonus-Penalty - a special contractual arrangement usually between a client and a contractor wherein the contractor is guaranteed a bonus, usually a fixed sum of money, for each day the project is completed ahead of a specified schedule and/or below a specified cost, and agrees to pay a similar penalty for each day of completion after the schedule date or over a specified cost up to a specified maximum either way. The penalty situation is sometimes referred to as liquidated damages. (11/90)

CONTROL - management action, either preplanned to achieve the desired result or taken as a corrective measure prompted by the monitoring process. (11/90)

CORRECTION PERIOD - the period of time within which the contractor shall promptly, without cost to the owner and in accordance with the owner's written instructions, either correct defective work, or if it has been rejected by the owner, remove it from the site and replace it with nondefective work, pursuant to the general conditions. (11/90)

COST - in project control and accounting, it is the amount measured in money, cash expended or liability incurred, in consideration of goods and/or services received. From a total cost management perspective,

cost may include any investment of resources in strategic assets including time, monetary, human, and physical resources. (1/02)

COST ACCOUNTING - The historical reporting of actual and/or committed disbursements (costs and expenditures) on a project. Costs are denoted and segregated within cost codes that are defined in a chart of accounts. In project control practice, cost accounting provides the measure of cost commitment and/or expenditure that can be compared to the measure of physical completion (or earned value) of an account. (1/03)

COST ANALYSIS - a historical and/or predictive method of ascertaining for what purpose expenditures on a project were made and utilizing this information to project the cost of a project as well as costs of future projects. The analysis may also include application of escalation, cost differentials between various localities, types of buildings, types of projects, and time of year. (11/90)

COST APPROACH - one of the three approaches in the appraisal process. Underlying the theory of the cost approach is the principle of substitution, which suggests that no rational person will pay more for a property than the amount with which he/she can obtain, by purchase of a site and construction of a building without undue delay, a property of equal desirability and utility. (11/90)

COST AND SCHEDULE CONTROL SYSTEMS CRITERIA (C/SCSC) - established characteristics that a contractor's internal management control system must possess to assure effective planning and control of contract work, costs, and schedules. (11/90)

COST CATEGORY - the name and number, or both, of a function, hardware, or other significant cost category for which costs are to be summarized. (11/90)

COST CONTROL - the application of procedures to monitor expenditures and performance against progress of projects or manufacturing operations; to measure variance from authorized budgets and allow effective action to be taken to achieve minimum costs. (11/90)

COST ENGINEER - an engineer whose judgment and experience are utilized in the application of scientific principles and techniques to problems of estimation; cost control; business planning and management science; profitability analysis; project management; and planning and scheduling. (11/90)

COST ESTIMATE - A prediction of quantities, cost, and/or price of resources required by the scope of an asset investment option, activity, or project. As a prediction, an estimate must address risks and uncertainties. Estimates 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. Cost estimates are determined using 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. See COST ESTIMATE CLASSIFICATION. (1/04)

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

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

COST ESTIMATE CLASSIFICATION–There are numerous characteristics that can be used to categorize project cost estimate types. Some of these characteristics are: degree of project definition, end usage of the estimate, estimating methodology, and the effort and time needed to prepare the estimate. The primary characteristic used to define the classification category is the degree of project definition -- the