

Reviews (Cont'd), Audits, Changes and Disputes

Nathaniel Osgood

4/28/2004

Announcements

- Dr. Granli talk May 3; 2 readings posted
- Optional “Skyscraper” video screening
 - Thursday (5-7pm)
 - PS5: Extra credit if write 5-7 page essay analyzing
- Talk on Design-Build-Operate-Transfer projects
 - Who: Robert Band, President & CEO of Perini
 - When: Thursday, 3:30pm
 - Where: 5-134
- Recitation Field Trip (Airport T) Tuesday May 4
- Meeting for brief review of TP3
- Note: Substantial material included herein from last year’s 1.040 materials by F. Pena-Mora

Topics

- Project Reviews
 - Logistics
 - Functions
 - Reviews in Construction
- Project Audits
- Changes
- Disputes

Granularity of Reviews

- Tradeoff
 - “Boundary effects” dominate if many small meetings
 - too few meetings
 - Superficial coverage
 - Spend time of personnel unnecessarily
- Focus is critical in reviews and meetings
- Appropriate agenda size can reflect #, style of participants
- Some companies adopt practice of single-agenda meetings

The Logistics of Reviews

METHOD FAMILY	PEER REVIEWS	WALKTHROUGHS	FORMAL TECHNICAL REVIEWS / INSPECTIONS
TYPICAL GOALS	<ul style="list-style-type: none"> > PROCESS GUIDANCE > EVALUATION OF WORK > LEARNING 	<ul style="list-style-type: none"> > MINIMAL OVERHEAD > DEVELOPER TRAINING > QUICK TURNAROUND 	<ul style="list-style-type: none"> > REQUIREMENTS ELICITATION > AMBIGUITY RESOLUTION > TRAINING > TO DETECT AND REMOVE ALL DEFECTS EFFICIENTLY AND EFFECTIVELY
TYPICAL ATTRIBUTES	<ul style="list-style-type: none"> > NO PREPARATION > INFORMAL PROCESS > NO MEASUREMENT > NO PROCESS EVALUATION > 2-3 PARTICIPANTS 	<ul style="list-style-type: none"> > LITTLE PREPARATION > INFORMAL PROCESS > NO MEASUREMENT 	<ul style="list-style-type: none"> > AUTHOR PRESENTATION > WIDE RANGE OF DISCUSSION > FORMAL PROCESS > CHECKLISTS > MEASUREMENTS > VERIFY PHASE

Topics

- Project Reviews
 - ✓ Logistics
 - Functions
 - Reviews in Construction
- Project Audits
- Changes
- Disputes

Peer Review

- Informal Review Conducted Among Specialists in the Same Field, Focused on a Particular Project Aspect and *Need Driven* Rather Than Following a Fixed Schedule
- Benefits:
 - Early Discovery Of Mistakes And Reduction Of Rework
 - Avoidance Of Similar Pitfalls in the Future
 - Enhancement of Team Spirit
 - Promotion of Learning
- Documentation Limited to Memos and Duration not Exceeding 30 to 60 Minutes

Walkthrough

- Semi-formal Work Quality Control and Approval Activity, Requiring Some Organization And Up-front Planning
- Purpose: Notify Stakeholders of the Completion of a Work Unit and Obtain Feedback on it
- Reviewers: Higher-ranked Personnel And Peers of the Development Team
- Meeting Lasting up to 90 Minutes
- Typically minor milestones require walkthrough

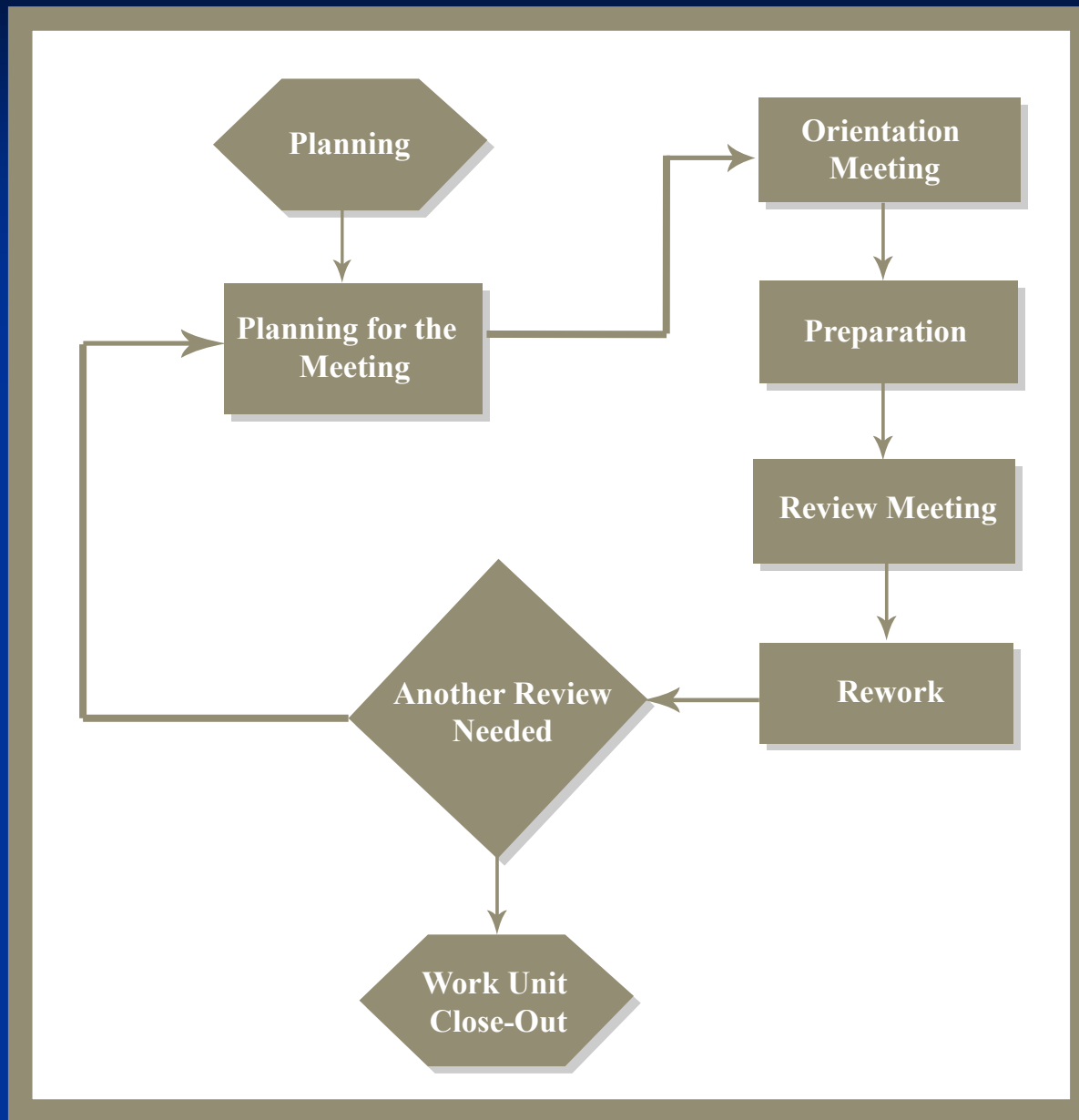
Inspection

- Inspection Viewed as One Form of Formal Technical Reviews
- A Formal Review : Technical or Managerial Personnel Analyses of the Quality of an Original Piece of Work Product and the Quality of the Process Itself
- Inspection in Construction : Substantial Completion Inspection
- Importance of Documentation and Formalism to Foster Feedback and Diffusion of Learned Lessons

Inspection

- Distinction Between Formal Managerial Review (FMR), Formal Technical Review (FTR) and Formal Logistical Review (FLR)
 - FMR focused on adherence to management standards, business plans, marketing plan and financial performance
 - FTR Focused on the Adherence to Technical Standards, the Need to Changes and the Effect of Changes Already Made
 - FLR focuses on the flow of information and materials and general efficiency of the logistics of the project

A Generic Inspection Process



Keeping Meetings Impersonal

- Goal is to focus on problems rather than people
 - Discuss process rather than ad-hoc decisions
 - Keep focus on needs of project
- Recriminating meetings
 - Do not make progress
 - Can lead to ongoing rifts among personnel
 - Defensiveness, emotions overwhelm analysis

Work Unit Validation-Passing Gates

- “Gates” Used to Close and Validate the Completion of Subsystems and Units of Work
- Two Main Functions of Work Unit Validation:
 - Quality Assurance on the Completed Subsystem
 - Critical Forward-looking Examination of How Subsequent Work Can Rely on the Completed Work
- Work Unit Validation Reviews : Formal and Technically Rigorous, with Some Legal and Contractual Security-Either Walkthroughs or Inspections

Quality Assurance

- Quality assurance reviews are essentially retrospective in character or process-oriented.
- Retrospective quality reviews investigate the quality of underway or completed work units in comparison to pre-established quality standards.
- Process-oriented quality reviews are held within an organization, for the purpose of examining the practices that affect the quality of work delivered.

Knowledge Transfer and Team Building

- Two Positive Side-Effects Rather than Pursued Goals
- High Importance of Teamwork and Learning in the Highly Segmented Construction Industry
- Suitability of Peer Reviews for the Promotion of Individual and Organizational Learning within a Workgroup, and for the Import of Knowledge through External Expertise

Topics

- Project Reviews
 - ✓ Logistics
 - ✓ Functions
 - Reviews in Construction
- Project Audits
- Changes
- Disputes

Value Engineering

- Value Engineering is the Process of:
 - Identifying and Quantifying the Performance of Various Systems in the Design of a Facility;
 - Evaluating the Costs and Benefits of Alternative Solutions that Achieve Similar or Better Performance for the same or lower costs
- Reviews are necessary for two reasons:
 - Need of Extensive Communication and Collaboration
 - Uncertainty in the Construction Industry

Constructability Reviews

A shared belief among contractors is that many scheduling problems, delays, disputes and technical difficulties during construction **result from failure of the design professionals to consider how a builder will implement the design.** This manifests itself in faulty working drawings, incomplete specifications, lack of standardization, complex contract language, but also in inherently “unbuildable” designs. Constructability reviews are a formal means of bridging the gap between designer and construction expertise so that these problems are overcome.

Constructability issues should not **drive** the design, nor is the constructability review process (CRP) just a way to make life easier for the contractor. **Rather, it is based on the idea that the design should accommodate constructability in its evolution from early on.**

A number of classification schemes for constructability information have aimed at identifying the areas where construction experts can contribute most to the design process . **These efforts have even resulted in automated expert systems that guide the conceptual design of a building with input about the structural material, the structural system, or details about the formwork, based on various parameters.** The main benefit of this research, however, is the **identification of constructability information that civil engineering designs lack, and the areas that should receive the most attention.** Typically, these are issues that (1) provide the designer with plenty of flexibility, (2) have a high labour cost component, and (3) provide the greatest opportunity for construction errors.

Substantial Completion Inspection

- It is a formal inspection that follows the contractor's request and a subsequent number of walkthroughs towards the end of the works.
- The project manager, the owner, the engineer and the architect inspect the (almost) completed project, and decide whether it is suitable for “occupancy for its intended purpose.”
- The SCI is a formal, contractually prescribed review, with important legal significance.
- Often serves as trigger for release of retainage
- Often create “final punchlist” at this point
- Sometimes followed by final completion inspection

Summary

- Reviews can be useful for bringing together technical and managerial personnel to examine prior work and projections into the future.
- Technical reviews must be separated from managerial, mainly for logistical reasons. Some technical input is required in managerial reviews though, and vice-versa.
- In form, formality and functionality, reviews range from informal peer reviews to contractually prescribed inspections with legal significance.
- The most important functions of reviewing are (1) passing progress gates, (2) quality assurance, and (3) knowledge transfer and learning.
- The construction industry has established value engineering reviews, constructability walkthroughs and substantial completion inspections as regular reviewing instruments.

Topics

- ✓ Project Reviews
 - ✓ Logistics
 - ✓ Functions
 - ✓ Reviews in Construction
- Project Audits
- Changes
- Disputes

Audits In a Nutshell

- Project audits are the most formal and comprehensive form of review.
- Project audits should be planned as standalone projects, with a goal, a life-cycle, a baseline and specific deliverables.
- Project audits represent the most formal learning opportunity.

Major Elements of Project Audits

- The Current Status of the Project and Projected Performance
- Critical Management Issues at the Strategic, Tactical and Operational Levels
- Risk Analysis
- Assumptions, Limitations and Quality of Data Used in the Audit
- Comments and Conclusions by the Author of the Audit

Financial, Management and Project Audits

A financial, a management and a project audit are three separate things.

Management audits examine the organization's management while project audits are focused on the impact of the management organization on a particular project and vice-versa. Moreover, both financial and project audits may share processes and investigation procedures. However, they have a different focus. Project audits focus, among other things, on the financial performance, the expenditures and the time spent on the project by the time of the audit, as they compare to the plan. Financial audits focus on the use and preservation of the organization assets. The scope of the project audit is broader compared to the limited scope of the financial audit.

Scope of Auditing

A full-extent audit is a very time-consuming and costly procedure, and it is not usually conducted unless there is a reason to do so. It may be sufficient to audit one integrated and complete part of the project – the one that seemingly caused problems or the one that has more lessons to offer. This way, organizations can achieve the best return on the process of auditing; i.e., minimize its cost while maximizing the benefit. Cost need not only be expressed in terms of money. The parameters that can be identified as costs associated with a project audit are the following:

Time: More often than not, time is seen as a constraint rather than the cost parameter. Indeed, audits are time-consuming, and projects are short of time. Therefore, it is the time constraint that partly dictates the depth of the audit. The relationship between time allocated and depth of the audits should be identified in the beginning of the audit life cycle if the audits are pre-planned, or mid-way through the project, whenever the audit is ordered. If the audit is a final evaluation of the project, conducted after it is over, then time may not represent a constrain, but rather a direct cost. In that case, the organization has to decide what can be the best benefit-cost ratio for an audit.

Note that the time needed for an audit depends on the nature of the project, its size, its complexity, whether it is localized or geographically dispersed, and the degree of completion. As the value of an audit changes according to the stage on the life cycle of a project that it is performed, the degree of completion must be taken seriously into account when managing the trade-off between time and depth of the audit process .

Money: The budget for an audit, and therefore its depth and extend, are most often determined by its requester. In any case, the expected cost must be justified by the expected benefits. These may vary from claims settlement to pure learning. However, in general, pre-planned audits tend to cost less than exceptionally requested ones: The average cost of an audit decreases, as the procedure is standardized and follows a predetermined baseline.

Impact on Performance: In the case of project audits conducted in the course of a project, the price paid for the audit is effect on personnel performance.

Apart from the time the personnel has to spend to provide the audit team with all the necessary information, and the distraction this may cause, their morale is adversely affected. These effects can be alleviated with the use of information technology and “pull” information systems. Nevertheless, the more comprehensive, deep and time-consuming the audit process is, the greater its effect on personnel performance.

The time and money required and the impact on personnel performance are reasons for wanting to keep the auditing process as small and focused as possible. However, this contradicts the character of an audit as a holistic evaluation; if it is to fulfil the objectives it is designed for, the audit must address at least one relatively independent aspect of the project comprehensively. Depending on the goals of the audit and the constraints mentioned above, organizations choose to conduct the following types of audits:

The **General Audit (or Overview)** is usually carried out after the completion of milestones specified by predefined contractual agreements. The resulting report superficially covers different issues such as current project status, future project status, status of critical tasks, risk assessment and limitations and assumptions of the process. An overview is conducted when the available time and money pose significant constraints.

The **Detailed (or Administrative) Audit** goes a step further than the overview. It examines some of the issues covered in the general audit in greater depth. The focus of the administrative audit may be on factors that offer themselves as lessons, cause problems or exhibit risky behavior. Care must be taken so that the detailed audit does not place factors out of context. Often, it will not be possible to isolate one aspect of the project and examine it independently; doing so may cause the auditor to miss cause-and-effect relationships and subsequently lead to wrong evaluations.

The **Technical (or Technical Quality) Audit** may be independent of the general overview of the administrative audit, as long as the technical aspects audited in loosely woven with the managerial ones. Some construction projects of low (or platform) technology, such as steel structures, may be audited independently from a technical perspective. The same applies to projects where the management methods completely (or almost completely) follow the technical issues, such as in some R&D projects. Technical audits are usually conducted early in the lifecycle of a project, because such decisions are taken early.

Who Needs the Audit?

- The project manager, who seeks unbiased and comprehensive information from groups or individuals within the project organization.
- The organization, which seeks to identify the errors made, track their causes, and learn not to repeat them.
- The clients, who can relate the value of project development to their own actions and decisions.
- Any external stakeholders or sponsors of the project; financial institutions, government agencies, consumer groups, environmental or religious organizations and social groups.

Current Project Status

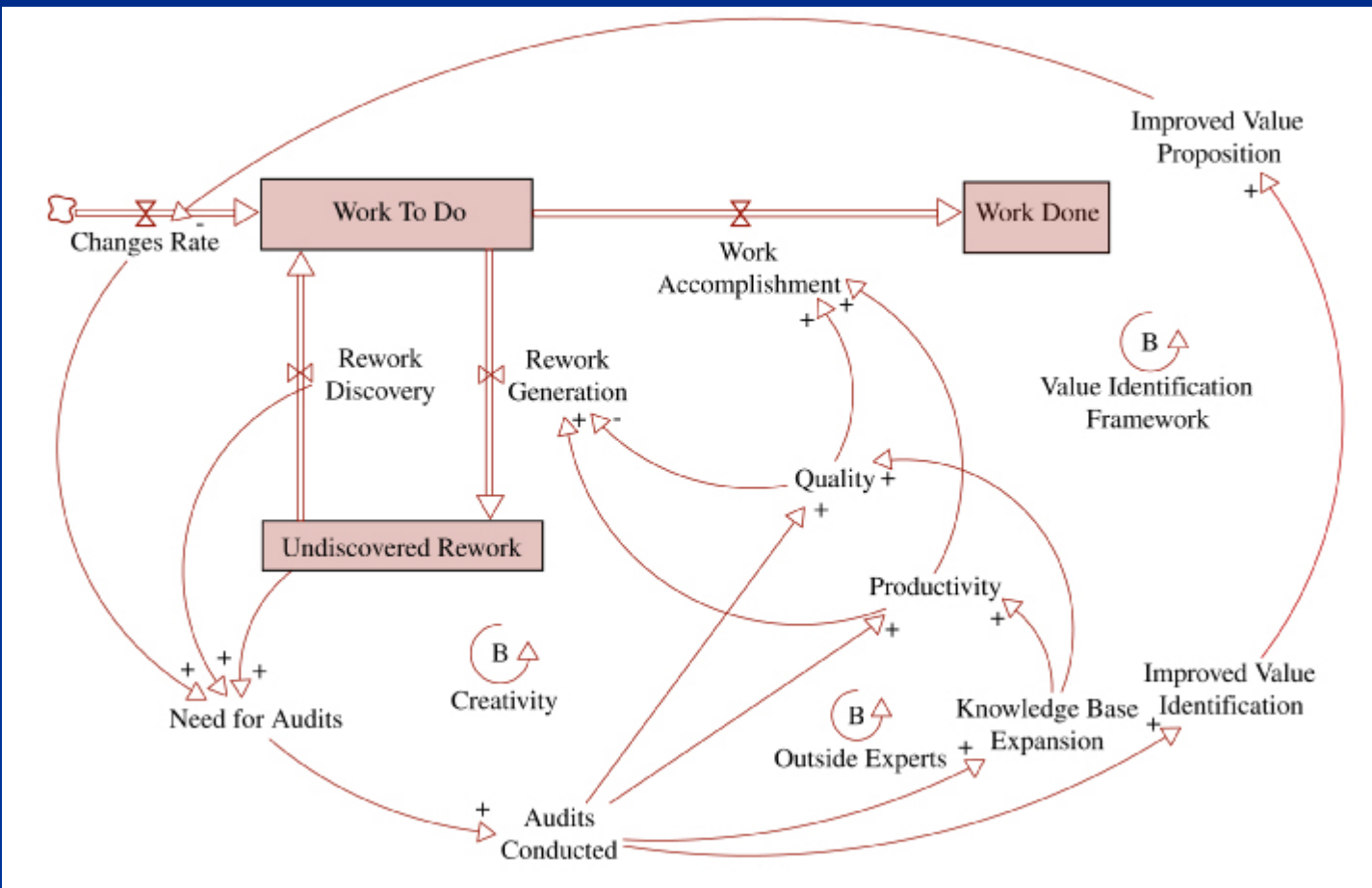
- Describing the Status of project Ecosystem
Consists of:
 - Reporting the Real Status of the Project: Quality, Schedule and Expenditures
 - Comparing the Current Status with the Planned Status: Earned Value Analysis (Cost/Schedule Control)
 - Evaluating the Conformance to the Designed Organizational and Work Breakdown Structure and its Effectiveness
 - Examining the Natural, Social and Political Environment

Causal Relationships

■ Clarifying the Causal Relationships within the Project Ecosystem Consists of Identifying the Causal Relationships and the Dynamic Interaction in the Following Relationships

- Schedule – Cost – Quality
- Staff Experience & Skill – Quality – Productivity
- Project Requirements – Organization Culture
- Stakeholders – Value Perception – Value Delivery
- Schedule, Cost and Quality – Strategic and Tactical Decisions
- Product-Specific Requirements – Work Breakdown Structure, Organizational Breakdown Structure, Product Development Model
- Information Flow & Record-keeping – Work Breakdown Structure, Organizational Breakdown Structure
- Monitoring Configuration – Corrective Actions – Time Delays– Ultimate Effects
- Resource Planning – Cost – Schedule – Performance
- Hiring Policy – Cost – Quality – Performance
- Financial Strategy – Explicit and Implicit Constraints Imposed – Strategic and Tactical Decisions

Causal Loop/Stock & Flow Diagram for Secondary Goals



Data Collection and Interpretation

- Information Needs and Sources Identified During the Planning Phase of an Audit
- Investigation and Data Collection Shaped by the Set Goals as Well as New Findings of the Audit
- Sources of Data: Documents, Accounts, Interviews, Questionnaires, On-Site Inspections and Benchmarking
- Data Resources: Existing and Derived (or Extracted)

Existing Data

Existing data, created and stored during project execution, is usually found in the files of the project, in electronic or paper form. Unless classified, it should be readily available to the audit team.

We will go over different data categories, their sources and usages:

-Customer (end-user) needs: The customer needs are not always explicit from the beginning of a project, even though these needs can be sometimes found in bidding documents and specifications, when the owners are sophisticated. Information about customer requirements can also be found in change orders and addenda. These documents can be vital in auditing contract termination, price adjustments and claims. Finally, relevant information can sometimes be found in unofficial records of meetings, early reviews, memorandums, facsimiles and emails.

-Specifications, Regulations and Technical Constraints that largely affect the product development process can be identified from the corresponding regulatory or engineering documents. In large projects that span over long time periods, they may change during development.

-Schedule, Cost Performance and Relevant Constraints: The relevant data can come from records of expenditures, invoices, account balances and bank records. These financial measures can be related to schedule performance, which in turn can be found in records of schedule, sub-contractor's reports, and technical reviews. The constraints imposed by the customer or other factors are usually either included in records of the organization or the entities that impose the constraints.

-Work Breakdown Structure (WBS): The work breakdown structure is obtained from early records of planning, subsequent reviews, and documents related to change orders and addenda. The derived breakdown structure should be examined and compared to the actual schedule for effectiveness and robustness. The purpose of investigating the work breakdown structure is to assure that the disaggregated work items correspond to directly measurable costs and time durations.

-The Organizational Breakdown Structure (OBS): This can be easily obtained from the organization's strategic management plan. The project OBS is usually stated explicitly for large projects. It should be compared to the structure that was actually materialized (this information can become available from interviews and memos), and whatever discrepancies should be evaluated for the possibility that they are more effective than the original design.

-Monitoring and Controlling Metrics and Methods: Monitoring metrics are amply available in peer review, walkthrough and inspection minutes. Relevant information can also be gathered by verbal examination and interviews, but monitoring records (e.g., schedules and baselines, resource allocation, quality certificates and approvals) are usually the most useful sources. In fact, the available information will probably be much more than what is needed for the audit. The audit team should examine and evaluate the monitoring metrics and methods used during development, for effectiveness, truthfulness, completeness and bias.

-Risk and Contingency Allowances: Risk management records and policies are to be found with the monitoring documents of the project and the tactical management's plans. Comparing initial assessment of risk factors with the project ecosystem's actual evolution provides an ad hoc indication of the success of risk management.

-Staffing Policy and Arrangements: Information about staffing policies and procedures, as well as their effectiveness, can be sought in new personnel's resumes, performance records and interview minutes. Direct interviews with the project teams and their supervisors can also reveal how effective the staffing arrangements were. The objective is to evaluate the policies and the decision-makers themselves, not to criticise the personnel hired or laid off.

-Communications Logs: It is wise practice for any organization to keep written records of all external communications. In the case of phone calls or live conversations, this can be done in the form of a "verification email" right after the call. For the auditor, the communication logs can provide insight to the human aspects and dynamics of problems, conflicts and personal tension, which often manifest (or become the cause of) more serious situations.

Furthermore, communication logs can reveal the response mechanisms to problems, and the time lag from the generation of a problem till it becomes an important issue of discussion.

Derived (or Extracted) Data

- Data Resulting From Synthesis, Compilation and Interpretation of Existing Data As Well As Unstructured and Undocumented Information
- Data Extraction Tools:
 - Questionnaires
 - Interviews
 - Workshops
- Powerful Tools But Prone to Bias, Misjudgment and Prejudice

Essentials for a Project Audit

- Project Audit As a Learning Process Comprised of Two Separate Processes:
 - Generation of the Lesson
 - Adoption of the Lessons by the Organization or Project Team
- Recipes for Success in the Learning Process:
 - The Audit Team
 - Access to Project Records
 - Communication With Project Personnel and Others
 - “Exogenous Causes Should Be Sought Inside the Organization
 - The Audit Should be Truthful and Honest
 - Auditing Personnel Performance
 - Audit Report Distribution

Communication With Personnel

- Importance of the Relationship Between the Audit Team and the Personnel
- Two Reasons for Communication Problems:
 - Unavailability Of Certain Personnel
 - Distrust Towards The Audit Team
- Personnel's Mental and Psychological Training to Audits (Pre-announced scheduling can help!)
- Compromise Between Friendliness and Professionalism of the Audit Team

Auditing Personnel Performance

- Evaluation of Personnel Performance (productivity, creativity, commitment, quality, response to unplanned situations, leadership, teamwork, adaptability to the project and organizational culture and relationships with other personnel)
- Evaluation Often Viewed As criticism and threat to the Profession
- Solution:
 - Focus on Situations, Not Individuals
 - Personnel Performance Taking Into Account the Organizational Structure and the Culture of the Organization

Audit Report Distribution

- Selective Report Distribution
- Importance Of Defining A Distribution List For The Report Early In The Life Cycle Of The Audit
- Comprehensibility Of The Report To All The Addressees
- Adequate Information Infrastructure: Pull Or Push
- Implementation Of Information Technology In Report Distribution

Phase 1: Initiation

- Setting of the Pursued Goals
- Formal Determination of Audit Scope: length, formality, the recipient list and the parameters of the project
- Tasks Involved:
 - Determination of the goals of the audit
 - Expert Team Formation.
 - Establishing the Purpose and the Scope of the Audit.
 - Notification of the Project Team

Phase 2: Planning

- Three Major Work Elements:
 - Determine the cost, time and technical constraints that do or will govern the auditing effort
 - Determine the means and methods to be used in the audit
 - Agreeing on a performance baseline
- This Step Includes:
 - building the questionnaires , the checklists and the data gathering forms
 - planning an interview schedule

Phase 3: Audit Execution

- Investigation Starts With Data Collection
- Investigation Follows With Data Analysis and Investigation, Focusing On:
 - Assessment of the Project Organization, Management, Methods and Controls
 - Statement of both Current and Former Status
 - Preliminary Statement of Forecasted Project Status
 - Working Quality Assessment
 - Delivered Quality Assessment
 - Lessons Learned – Action Plan
- Audit Execution Followed by Self-Scrutiny Review

Phase 4 : Report Preparation and Release

- Audit report Conform to the audit requirements and needs
- released according to the distribution plan
- Importance of Planning the logistics of report preparation and release
- The policies for conducting and distributing the report Balancing political correctness, ease of assimilation of the lessons, truthfulness and brevity.

Phase 5: Project Audit Closeout

- Three Essential Steps:
 - Audit Database and Document Filing by audit service management division
 - Post-Audit Consulting: the last chance for the project team to discuss with and learn from the auditors
 - Audit Program Evaluation. The effectiveness, quality, sophistication and depth of the audit are examined. the problems the audit team encountered during their job are also listed

Project Audit Report

- A formal document presenting all the work done and the conclusions reached
- Report Parts:
 - Introduction: Project and Audit Scope, Objectives and Circumstances
 - Current Project Status: entire project ecosystem
 - Future Projection
 - Recommendations about changes in technical approach, budget and schedule for the remaining tasks
 - Risk Assessment and Analysis:
 - Limitations and Assumptions of the Audit : listing of Time, depth, lost records, negative attitudes, focus in specific directions, assumptions and poor inputs

Summary

- Use Project Audits to reveal the interactions between elements in the project ecosystem and their effects on the project.
- Configure audits to investigate the project (or a part of it) specifically. In doing so, they must be honest and objective. Only then will they be useful.
- Plan audits carefully: Establish a baseline for comparison, but be open to in-depth investigation if necessary. If the project is long or complex, plan them as continuous learning processes, and extend their life into the project's operational phase.
- Make audits worthwhile: Introduce the auditing procedure as an integral part of the product development process. Teach people to appreciate it and learn from it. It works for them, not against them.

Topics

- Project Reviews
 - ✓ Logistics
 - ✓ Functions
 - Reviews in Construction
- ✓ Project Audits
- Changes
- Disputes

Background on Changes

- Very common (100s typical in high-rise)
- Change *contract*
 - Scope of work/schedule/cost/drawings
- Often start as informal owner requests
- Often contractor does not wait for formalization
- Contingency allowance traditionally designed to cover
- Normally cover direct costs; schedule impact must be proven to claim indirects

Directed vs. Constructive Changes

- Directed Changes: Formal request by owner to perform work differing from that specified in contract (modification/addition/deletion)
- Constructive changes: Informal act by owner authorizing/directing/requiring modification
 - Failure of owner to act may cause
 - Must be claimed in writing within specified time
 - Claim is that something has implied “de facto” change in contract requirements
 - Examples: Defective plans&specifications, ambiguous plans, impossibility of performance

Change Background 2

- Have very different level of
 - Occurrence in different projects
 - Can be used as cash cow
 - Fast-tracking substantially raises likelihood
 - Level of impact during stage of project
 - Changes early in project much easier to accommodate

Common Sources of Change

- Caused By Owner/AE
 - Defects in plans/specs
 - Delayed access to site
 - Slow submittal approval
 - Scope/Design changes
 - Acceleration
- Caused Contractors
 - Late start
 - Inadequate resources
 - Subcontractor/supplier failures
 - Poor workmanship
 - Schedule delay
- Externally caused
 - Unforeseen site conditions
 - Regulatory changes
 - Zoning
 - Code
 - Environmental
 - Labor disputes
 - Third party interference

Change Requests

- Contractor-origination workflow
 - CM
 - Evaluation by A/E, CM, Owner
 - Approval: Change Order
 - No approval: Unresolved
 - May escalate to a claim
- For owner, often result from RFP

**“Initiator” Change Order Request
for Immediate
Work**

Change Orders/Directives

- Change Requests Result in
 - Change orders: Bilateral agreement to modify contract terms
 - Construction change directive: Unilateral contract modification in the absence of complete agreement
 - Typically passed through A/E or CM

Conflicting Terminology

Type of contract modification	Private & Non-Federal Public	Federal
Bilateral	Change Order	“Contract Amendment” “Supplemental Agreement”
Unilateral	“Work Change Directive” (EJCDC) “Construction Change Directive” (AIA)	Change Order

Change Asymmetries

- According to many construction contracts owner can order contractor to continue work under modified terms even if contractor doesn't agree to change request
 - “Proceed without hesitation”
 - Contractor may “work under protest”
- Contractors in favorable pricing position
 - Owner may appoint “on call” contractor for changes

Definitions of Delays

- Delay
- Excusable Delay vs Nonexcusable Delays
- Compensable vs Noncompesable Delays
- Critical vs Noncritical Delays

Delay

Time during which some part of the construction project has been extended or not performed due to an unanticipated circumstance.

Causes:

*Differing Site Conditions
Changes in Requirements or Design
Inclement Weather
Unavailability of Labor, material, or equipment
Defective Plans or Specifications
Owner Interference*

Caused by:

*Contractor
Owner
Designer
Subcontractors
Suppliers
Labor Unions
Utility Companies
Nature*

Excusable Delays

Delay that will serve to justify an extension of the contract performance time. It excuses the party from meeting a contractual deadline.

Excusable Delays:

Design problems

Employer-Initiated Changes

Unanticipated Weather

Labor Disputes

Fire

Unusual Delay in Deliveries

Unavoidable Casualties

Acts of God

Nonexcusable Delays

Delay that for which the party assumes the risk of delayed performance and its consequences to its own performance and the impact upon others.

Nonexcusable Delays:

Unavailability of personnel

Subcontractor failures

Improper installed work

Unforeseeability

- Late Delivery due to Strike
 - Strike clearly foreseeable and contractor did not plan for it.
- Project Strike
 - Unfair labor practice of contractor can be corrected by the contractor
 - Unfair labor practice of subcontractor can be beyond the control of the contractor
- Shortage of Capital, Failure to Provide Adequate Equipment or Labor, Failure to Order Materials in a Timely Manner, Failure of the General Contractor to Coordinate the Work of its Subcontractor, Failure to Evaluate the Project Site

Impact of Nonexcusable Delay

- May be considered breach of contract
- May justify the termination of the contract
- Liquidated damages may be assessed
- Normally, extensions are not granted
- Expected to be absorbed into the schedule

Compensable Delay

- Delay that could have been avoided by due care of one party is Compensable to the innocent party suffering injury or damage as a result of the delay.
- Both cost and time may be Compensable but sometimes only additional cost is Compensable.

Provisions

- Change Clause
- Suspension Clause
- No-Damage-for-Delay Clause
- Liquidate Damage Clause

Critical Delays

- Extend the Project Completion
- Not necessarily link to recovery of costs of delay
 - Impact to cost of performance
- 2 year delay on a not critical facility may increase the cost of the building.

Topics

- Project Reviews
 - ✓ Logistics
 - ✓ Functions
 - Reviews in Construction
- ✓ Project Audits
- ✓ Changes
- Disputes

Disputes

- Can have major impact on all aspect of project performance and quality of life
- Growing problem
- Need to focus on both
 - Prevention
 - Clear scope
 - Early identification of problems
 - Equitable Balance of risk in contract
 - Selection of contract terms appropriate for anticipated issues
 - Management (for work to continue during dispute)
 - Resolution
 - Mutually-agreed means for prompt, equitable resolution of disputes

Common Claims Issues

- Owner-caused delays
- Owner-ordered scheduling changes
- Constructive changes
- Differing site conditions
- Unusual weather conditions
- Orders to accelerate work
- Loss of productivity
- Suspension of work
- Failure to agree on change order pricing

Claims Progression

- Claims begin as disagreements between
 - Owner
 - contractor
- Contractor must notify owner of disagreement
 - Often done through formal letter of “protest”
 - Submitted according to contract conditions
 - Formally responded to by owner or representative
- If cannot work out mutually agreeable course of action, proceed to formal claim

Identifying Possible Conflicts

In order to identify the conflicts that surface in a project, we review the common sources of conflict, accepting these as the major sources of conflict on any given project. If the project does, then that may be an indication that perhaps it was not a good project to undertake. Identifying which of these conflicts have the potential to occur and have an impact on the project is the hardest step in the process of designing a Conflict Management Plan.

Effect of Delivery System on Identifying Conflicts

- Identify the Potential Conflicts that Need to be Avoided
- Select a Delivery System that Minimizes Such Conflicts

Example: Selection of a Delivery System

- Stephenson (1996)
 - Establish a Detailed List of Potential Conflicts Based on Historical Data or Personal Experience
 - Identify the Relationships Between the Participants (For Ex, Owner-CM, Owner-Designer)
 - For Each Delivery System, Match the Potential Conflict with the Concerned Relationships and Give it a Specific Number of Points
 - Add up the Total Number of Points for Each Delivery System and Choose the Best Approach

Analyzing Identified Conflicts

- Probability of Occurrence of Conflicts
- Impact of Potential Conflicts on Project

Examples

- Probability of Occurrence of Conflicts
 - Assume that the Identified Sources of Conflict Are Misunderstandings, Unrealistic Expectations and Poor Communication, Compare the Two Cases:
 - Case 1 : Owner and Contractor With Previous Experience Together, in the Same Geographic Region
 - Case 2 : Owner Venturing into a Neighboring Country and Working with an Unfamiliar Contractor
- Impact of Potential Conflicts on Project
 - Two Similar Projects With Introduction of Design Change Halfway Through Construction
 - Project 1 : Design-Bid-Build Approach
 - Project 2 : Design-Build Approach

Probability of Occurrence

- Organizational Issues

- Uncertainty

Organizational Issues

- Structure Conflict: Example: Contract Terms
 - Case 1 : Fair and Reasonable Allocation of Risk → Low Probability
 - Case 2: Unfair, Unreasonable Allocation of Risk → High Probability
- Process Conflict: Example: Performance and Quality
 - Case 1: Cost-Plus, Quality Driven Projects, Inspection Staff → Low Probability
 - Case 2: Competitive Bids Award to Lowest Bidder, Bad Reputation → High Probability
- People Conflict: Example: Management
 - Case 1 : Long Distinguish Solid Managers → Low Probability
 - Case 2 : Inexperienced Participants → High Probability

Uncertainty

- External Uncertainty : Example: Political Risks
 - Case 1 : Stable, Well Developed Governments → Low Probability
 - Case 2 : Afghanistan During the Soviet Invasion Throughout the 1980's → High Probability
- Internal Uncertainty : Example : Unforeseen Site Conditions
 - Case 1 : Open, Above Ground Projects with Adequate Investigation → Low Probability
 - Case 2 : Lack of Subsurface Investigation for All Participants → High Probability

Impact of Conflict

- Quantification Tools
 - Historical Data
 - Experience and Knowledge
- Example
 - Weather: Low Impact in Construction ‘Friendly’ Environment and High Impact in Areas Prone to Natural Disasters

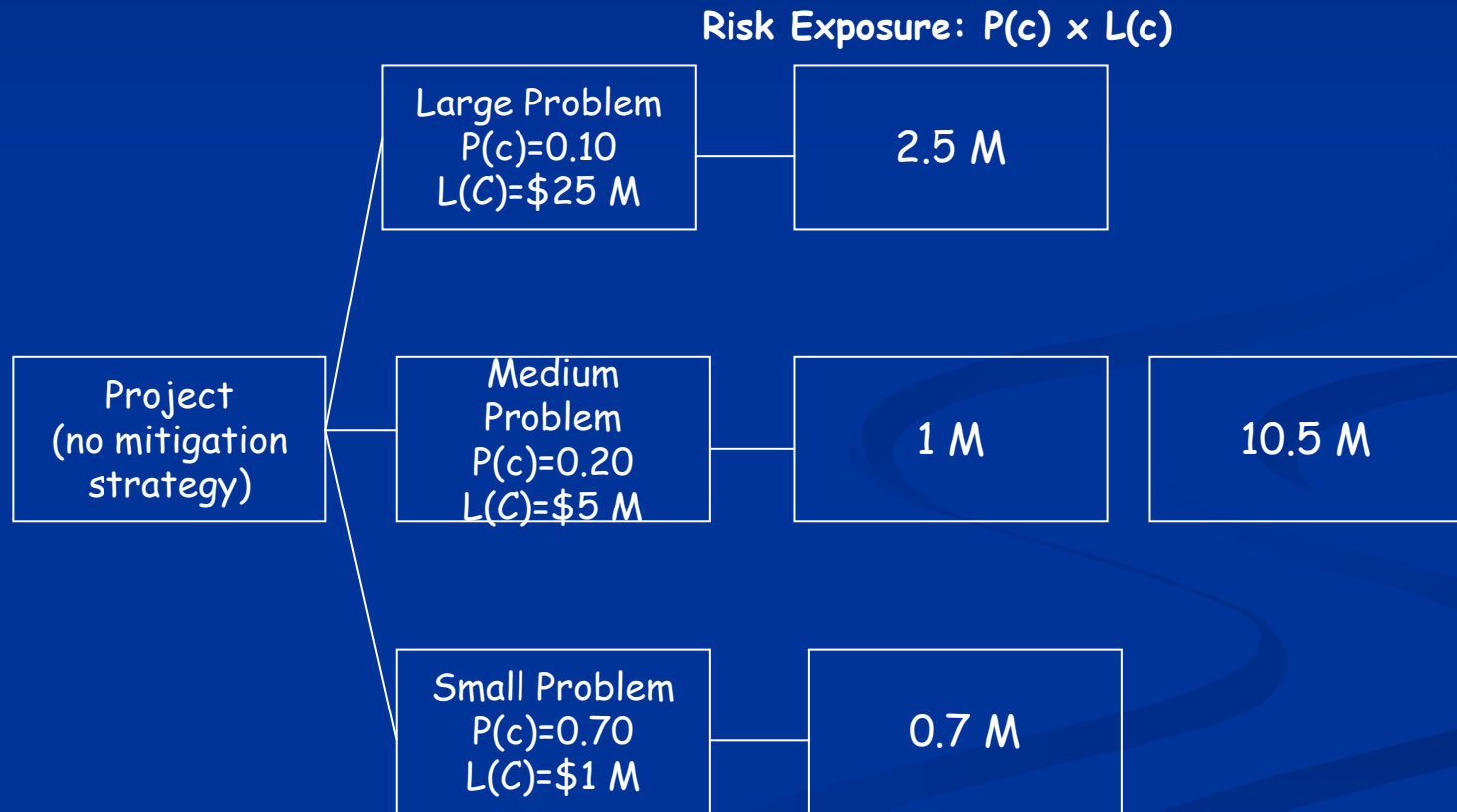
Combined Conflict Exposure

- Step 1 : Calculate Conflict Exposure= $P(C) \times L(C)$

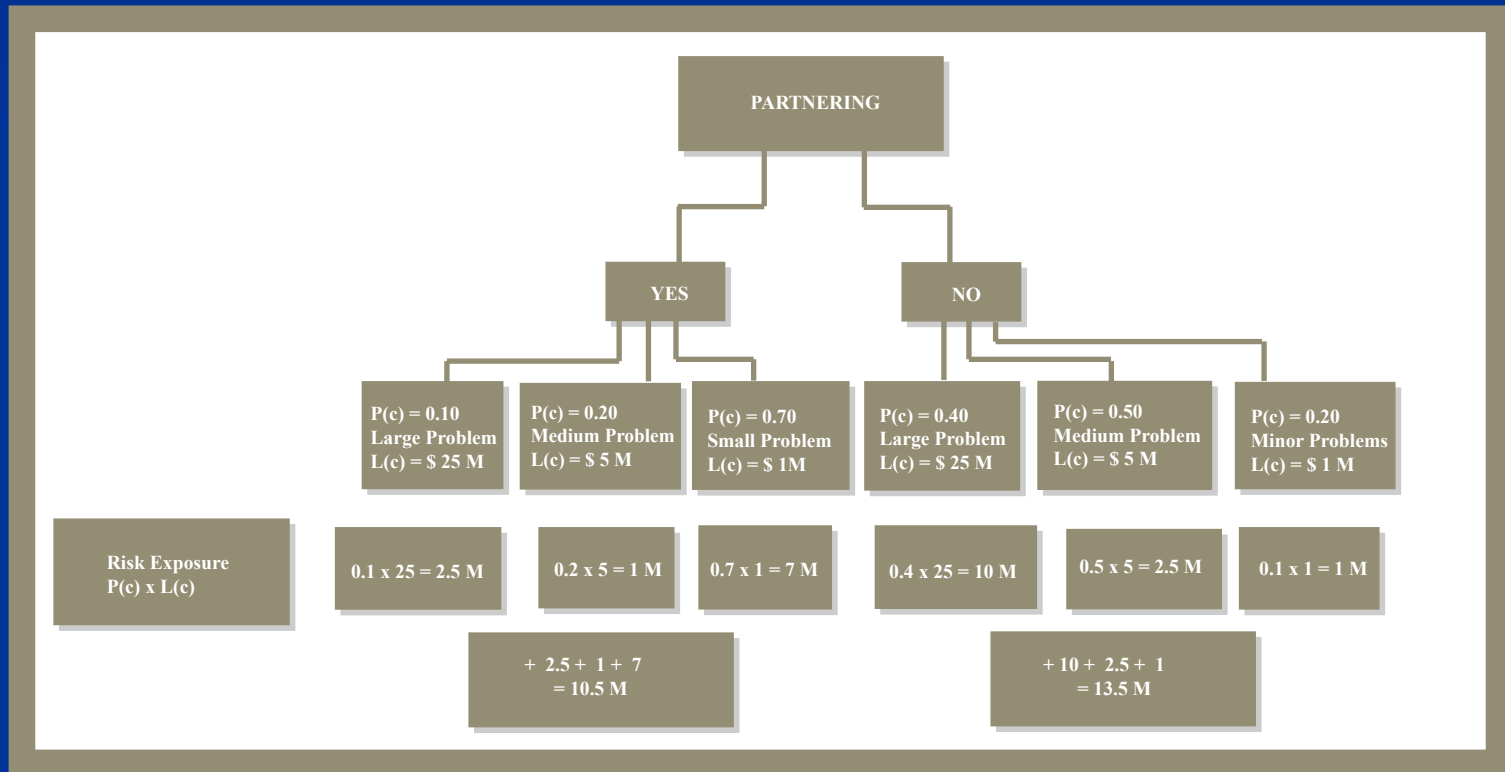
Where:

- $P(C)$ Is the Probability of Occurrence
- $L(C)$ Is the Impact of Occurrence
- Step 2: Group Conflicts Into Priority Levels:
 - Group A : 10-20% of the Top Conflicts Accounting for Roughly 60% or More of the Total Potential Impact
 - Group B : Conflicts not in A or C
 - Group C : Large % of the Bottom Conflicts Accounting for 10% or Less of the Total Potential Impact

Example: \$200 M Project



Use of Decision Trees



Contingency Plan

- List of Options of Both Parties
- Strengths and Weaknesses of Conflict Management Plan
- Identification of Areas Where No Conflict Mitigation Plan is Implemented
- Backup in Case of the Unpredictable (Mainly Litigation) : “What If?” Process

Example Matrix

Returning to the Brock and Kelly case, the siblings are facing the task of designing a Conflict Management Plan. Kelly identified the following as the major sources of conflict in the \$1.5 billion program.

By local regulation, Kelly was restricted to competitively bidding all of the contracts. To align the objectives, reduce miscommunication and disruption she decided to invest in a Partnering program. In addition to Partnering, she hired an independent Program Manager to help handle the load of the projects that the government agency is taking on. Independent Quality Control inspectors were also assigned to the construction phase to watch over the contractor. A clause was added in the contract that requires the contractor to provide a Quality Assurance representative as well.

Both of these personnel aim to reduce the Performance and Quality conflicts.

Following the prevention aspects of the Plan, Kelly opted to use a DRB to resolve disputes that arise to reduce the impacts of these disputes. This was not included in the Table because it applied to all of the sources of conflict. The DRB panel will consist of 3 members, one appointed by each party and a third jointly selected by the appointees. Disputes can be submitted to the DRB at any time during the project only after the parties have attempted at least three rounds of good faith negotiations, with or without a mediator paid for by the owner. The DRB panel has the power to issue binding solutions so as not to affect the schedule of other contracts.

Dispute Resolution

- Three components for guiding dispute resolution
 - Common sense (notification of owner if concern before claim filed)
 - Contract-specified terms
 - E.g. AAA “Construction industry mediation rules”
 - Several steps, discussed later
 - Public case law

Progression

- Negotiation
- Stand-in neutral
- Mediation
- Arbitration
- Litigation

Negotiation

- Informal discussion
- No costs
- Efficient
- May be brief

Stand-in Neutral

- 3rd party with relevant experience
- Paid by both parties
- Provides expert advice
- Non-binding (parties can still refuse to accept advice)

Mediation

- Officially trained, recognized mediator helps resolve
 - Choice of mediator agreed upon by both parties
- Voluntary
 - Parties in dispute must come to agree on wisdom of solution
 - No authority to enforce verdict
- Mediator adopts *active* role
 - Less formal meetings for counseling parties
 - More Formal proceedings assist
 - Gathering facts
 - Clarify discrepancies
- Rapid
- Economical
- Typically confidential

Arbitration

- Can be legally binding and enforceable
 - Imposed on parties
 - More “final” than courts – no appeal possible in most cases, no explanation of award required)
- Frequently publically known
- Typically “passive” – depend on formal presentations by participants
- Faster than litigation (months vs. years)
- 5 step process
 - Agreement to arbitrate
 - Selection of arbiter
 - Preparation for hearing
 - Hearing
 - Award (within 30 days of close of hearing)

Litigation

- Public
- Established case law
- Explanations common
- Expensive
- Lengthy (5+ years to reach trial)