Change Management

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  - **2010 – Present - Visiting Professor USM School of Construction**
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about me: been photographed in red dress running for orphanage charities in 10 countries, having supported the raising of more then $1 million in donations!

1.
Introduction to
Change Management

Introduction

- Change Management Resources
- Key Objectives for Success
- What is Change Management?
- Types of Change Management
- Why Change Management?
- Inputs, Outputs & Processes

Key Objectives for Successful Change Management

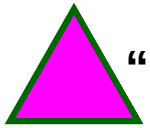
- Organizational requirements
- Identifying change
- Understand full implications on cost & schedule
- Estimating change's full "cost" [not just $]
- Planning & scheduling to account for & accommodating change & its impacts
- Identifying & implementing mitigation strategies
- Controlling change
- Timely & proper communications

Change

- Focus on Project Change:
  - **Adding, revising or deleting Scope that results in adjustment to:**
    - **Quality, Functional or Performance Requirements,**
    - **Price (not cost), and / or**
    - **Schedule**
  - **Fully capture / document added cost & time**
    - **Must include impact of change on unchanged work**
  - **Change == Risk**
    - **Treat proactively & accordingly to improve upon current position**
- Types of Change
  - **Project Development**
    - **Change to terms & conditions of defined scope**
  - **Scope**
    - **Change in content or parameters**
      - **Size, capabilities, use, product mix, location, etc.**
      - **Can only occur once scope is identified / quantified**
  - **Change can be**
    - **Anticipated or Evolving / Emergent / Unanticipated**

Definitions

- Change:
  - **To cause to be different … To alter or transform … To lay aside, abandon, or leave for another; switch … The act, process, or result of altering or modifying … substitution … To alter one's approach … To undergo a variation of … A relative difference … A disparity in nature … To make different …**



"Delta" = Change

- Management:
  - **The act, manner, or practice of managing; handling, supervision, or control … The person or persons who control or direct a business or other enterprise … Skill in managing; executive ability.**

- Managing the Process vs. Administrating the Process
  - **Proactive vs. Reactive**
    - **Mitigation vs. Change (%#^!) Happens**

Simple Definition

- Change Management is successful practice of:
  - **Managing & controlling scope & costs by**
    - **Recognizing that change has occurred**
    - **Timely communicating throughout process of working though / resolving change**
    - **Efficiently incorporating change**
    - **Monitoring & controlling change**
    - **Efficiently resolving time & cost impacts**
    - **Continuous improvement based on knowledge gained from change events**
  - **Change management is applicable throughout the various execution phases of a EPC project / program**
    - **Starts at Concept / FEED (Front End Engineering & Design)**
    - **Continues through EPC – Engineering, Procurement & Construction**
    - **Continues through Startup & Commissioning (& beyond)**
- Negative Euphemisms for Change
    - **Engineering or Field Directive; Supplemental Instruction; Modification; Scope Creep; Revision; etc.**

Types of Change Management

- Major elements:
  - **Organizations & People**
  - **Programs & Projects**
  - **Systems**
- While touching on all forms, today will focus primarily on:
  - **Capital Projects / EPC / Design-Build**
  - **Contract form (cost reimbursable, lump sum, unit rate, etc.) does not really matter**
  - **Cost & Schedule as a couple**

Change Management Focus

- Plan | Communicate | Assess
- Across all industries
  - **Information Technology (IT)**
  - **Engineering & Construction (E&C)**
  - **Manufacturing**
  - **Services**
  - **Agriculture**
  - **Etc., etc., etc.**
- Once basic concepts are understood, applies equally well to all industries & organizations

2.
Interrelationship Between
Scope Control & Change Management

Scope Control & Change Management

- What is Scope Control & how does it relate to CM?
- CM predicated on scope of work
  - **Clearly defined / established scope of work is fundamental**
  - **Sets baseline for measurement**
- Scope will change
  - **Mechanism to measure against both baseline & changed scope**
  - **Validate change against baseline scope (cost & schedule)**
- Baseline established by:
  - **Contract / Agreement – Commercial Basis of the Work**
  - **Scope of Work (Services and / or Facilities)**
  - **Management Level Schedule**
  - **Control Estimate / Budget**
  - **Project Execution Plan**
  - **Risk Assessment / Plan**

Inputs

- Project Implementation Basis (living documents)
  - **Scope, Cost & Schedule basis documentation**
  - **Project Execution Plan (PEP)**
- Project Control Plans
- Deviation Notices & Change Requests
- Variances
- Corrective Action Alternatives
- Alternative Forecasts
- Risk Management Information

Key is identification & communication of change by all team members

Not solely a Project Management / Project Controls responsibility

BE VIGILENT FOR CHANGE!

Outputs

- Updated Project Control Plans
- Updated Project Control Basis
- Updated Scope Definition
- Trends
- Selected Corrective Actions & Approved Scope
- Corrective Action Alternatives
- Alternative Forecasts
- Historical Project Information

Processes

- Asset Change Management
- Project Change Management
  - **Deviations**
  - **Variances**
  - **Trends**
  - **Changes**
  - **Corrective Action**

Will define & address In more detail later.

- Key to classifying is understanding Root Cause
  - **Often confuse effect as being the cause**
  - **Need to identify Root Cause, not just contributing cause(s)**

Is Your Organization Ready?

- May be ready if:
  - **Correct team has been assembled**
    - **Correct mix of skill & experience for endeavor**
    - **Backed by correct resources**
  - **Goals & priorities for project / program clearly understood by team**
    - **Clear expectations, with measurable targets**
  - **Are you flexible?**
    - **Must allow for change & conflict**
    - **Have work practices in place**
  - **Does culture allow for success?**
    - **Leadership versus lip service**
    - **Removes cultural barriers & resolves conflict**
    - **Defines & holds people accountable**
    - **Publicly rewards people for success**

Principles of Effective Change Management

- **Promote a Balanced Culture**
  - Encourage beneficial change
  - Discourage detrimental change
- **Recognize Change**
  - Education
  - Communication
  - Documentation
  - Trending
- **Classify Change**
  - Root cause analysis
  - Classifications
- **Evaluate Change**
  - Elective
  - Required
  - Decide quickly
- **Implement Change**
  - Authorization
  - Documentation
  - Tracking
- **Continuously Improve**
  - Share lessons learned
  - Be prepared to improve

CII Implémentation Ressource 166-3, Figure 14-1

Elements of Change Management

- Establish solid baseline to recognize & measure
- Classification system
- Effective implementation of required change
- Justification on dealing with elective change
- Define responsibility for necessary action
- Collection & timely reporting of data / metrics
- Monitor & benchmark performance
- Consistency in data collection & documentation
- Beneficial change recognition
- Top to bottom alignment

CII Implémentation Ressource 166-3

Scope Creep

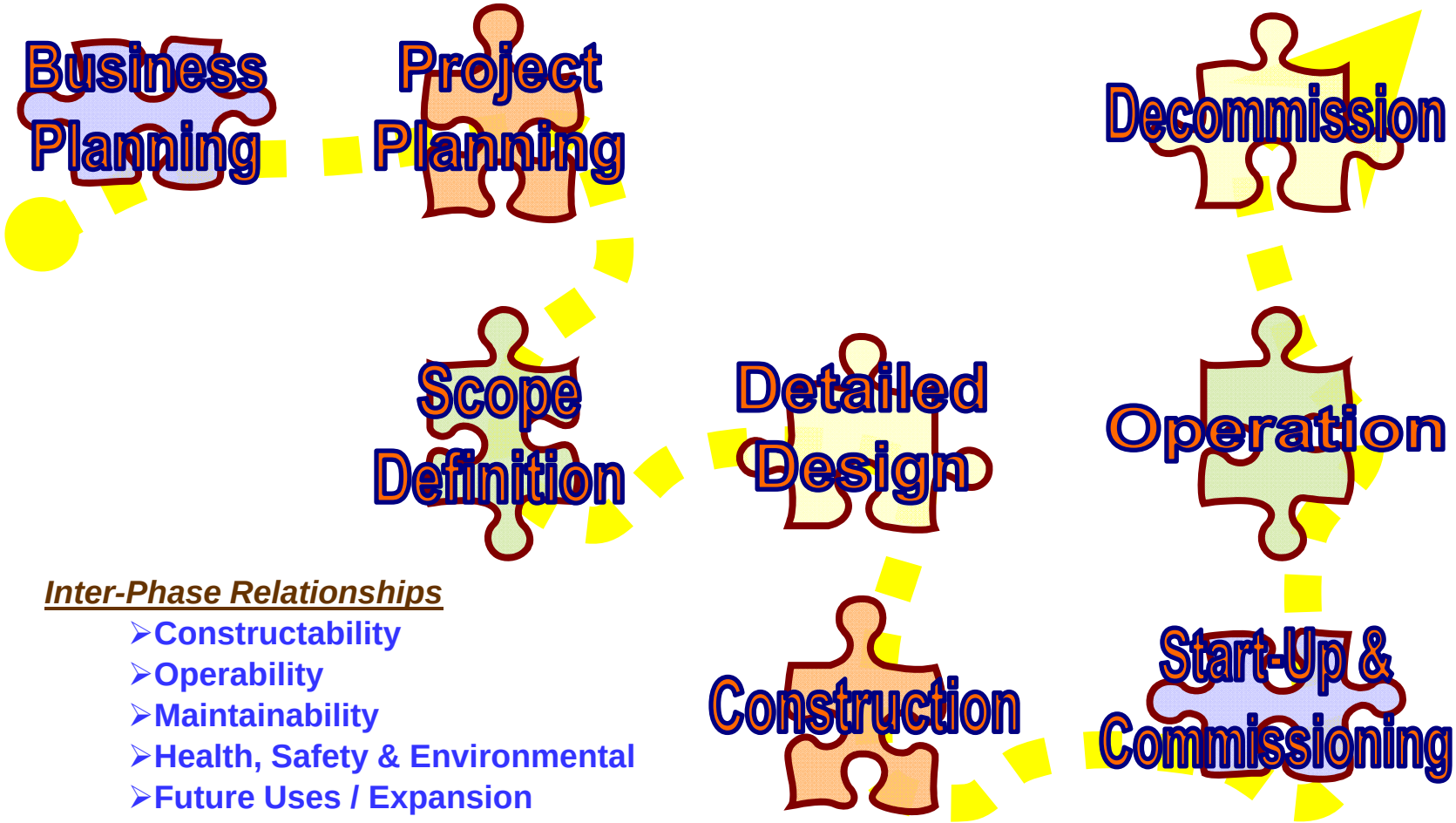
- Unauthorized scope changes
  - **Often insidious**
- Change Management process is circumvented or abandoned
  - **Often done with good intentions**
  - **Many unintended consequences**
- Formal authorization lacking
  - **Puts parties at risk for becoming a "volunteer"**
- To avoid scope creep
  - **All must understand what is in / out of baseline scope**
  - **Institute & manage rigid / formal authorization process**
    - **Empower all to identify, but few to authorize**

NOTICE: *Traps for the Unwary*

- Why timely Notice is important
  - **Internal == "notice" Discovery / Awareness**
  - **External == "NOTICE" Contractual Notification**

- Proper external Notice is critical
  - **Preserves ability for recovery of cost & schedule damages**
  - **Allows parties to mitigate risk & damages**
  - **Many Notice traps**
    - **Read & understand contractual requirements**
      - **Timing changes by type of issue encountered**
      - **Notice format & content changes with issue**
      - **Periodic notice updates often required**

Change as a Constant Companion



Inter-Phase Relationships

- Constructability
- Operability
- Maintainability
- Health, Safety & Environmental
- Future Uses / Expansion
- Stakeholder Perspectives

Change Management Dynamics

- Change occurs for many reasons
- Regardless of type & magnitude of change, complex organizational & personal dynamics play a key role
  - **Complexity increases over time**
- Key elements that impact process:
  - **Project Organization**
  - **Project Stakeholders**
  - **Project Scope**
  - **Execution Means & Methods**
  - **Control Methodology & Communications**
  - **Contract Risk Allocation & Mitigation**

3.
EPC Change Management Best Practices

Company / Project / Team Culture

- Encourage beneficial change
  - **Tied to critical project success factors**
  - **Timely & accurate impact assessment**
  - **Anticipate change with contingency**
  - **Recognize & reward**
- Discourage detrimental change
  - **Understand what is detrimental**
  - **Require financial justification**
  - **Maintain accountability**
- Institutional impediments to change
  - **Standard form contracts lack change management provisions (separate from changes clauses)**
  - **Ownership and leadership issues – abdicate responsibility**
  - **No incentive to resolve expeditiously – incentive to delay**

System Overview

- Recognize Change
  - **Identification - early warning system**
  - **Notification - usually contractually time limited**
- Evaluate Change
  - **Assessment – be aware of ripple effect**
  - **Documentation - timely submittal**
  - **Authorization - written approval to proceed**
- Implement Change
  - **Integration - Project Controls adjusted**
  - **Implementation**
    - **Update all action plans - safety, quality, material management, etc., before initiating field activity.**

Change is a Constant Companion

Begins at project inception …
may be resolved well after final completion.

Best practices: *Full Follow Through*

- **STARTS with change identification / awareness / notice**
- **Contractual requirements / steps**
  - **Formal Notice to other party**
    - **Allows for investigation, mitigation & direction on path forward**
  - **Contemporaneous documentation of change's cost & schedule**
  - **Presentation & negotiation of change's price & time**
- **ENDS with timely resolution**
  - **Avoid lengthy & costly disputes resolution process**

Continuous Improvement

- Change Management is …
  - **not a sequential process;**
  - **nor, once change is Recognized, Evaluated & Implemented …**
  - **should it be addressed once & forgotten.**
- Throughout life cycle of project:
  - **Develop metrics for monitoring & forecasting**
  - **Provide feedback to project team members**
  - **Populate historical database for benefit of future projects**

Follow through is essential to successful & timely resolution

More Definitions - Change Classification

- Following terms integral to any change management system
- Terms have multiple meanings & uses within industry & companies
- Owner vs. Contractor misunderstandings
  - **Movement of project professionals between organizations**
- Used in Classifying Change & Change Responsibility
  - **Deviations; Variances; Trends; Corrective Action**
  - **Other terms / classification ('buckets')**
    - **Design Revisions – Changes in technology, operations, maintenance, product or use**
    - **Errors / Omissions – Scope, design or specifications**
    - **Market Conditions – Resource availability / conditions, ROI**
    - **Performance – Time or performance issues**
    - **Differing Conditions – Force Majeure, Changed Site or Weather**
    - **Choice – A deliberate desire to change or accelerate / delay the work**

change vs. CHANGE ORDER

- When potential change first identified
  - **Just a possibility & not formally classified**
- However, important to identify on ROM basis
  - **Potential cost & cost impacts**
  - **Potential delay & delay imp**
- ROM estimates
  - **Basis documentation**
  - **Will evolve over time**
    - **As change is better understood**
      - **Small initial change can later evolve to create significant impacts**
    - **As plan to incorporate & mitigate are developed**

Deviations

- A departure from established requirements.
  - **Deviations occur when work fails to meet or unnecessarily exceeds requirements. Change (positive or negative) may be considered potential or already occurring.**
  - **Deviation provides detailed description & estimate (detailed or ROM) of change impacts resulting from design developments, productivity, omissions, errors, price fluctuation, supplier changes, etc., that changes forecast cost & schedule.**
  - **Deviations are documented by Project Controls & communicated to Project Manager. A deviation provides project team with opportunity to mitigate an adverse impact or to optimize outcome & is a primary communication tool.**
- Deviation as used herein refers to a single point variance. Trend refers to a pattern of a data group.
- Examples include
  - **Quantity & price fluctuations; productivity trends; errors & omissions; design development, vendor data changes**
  - **Be mindful of specific contract & organizational specific definitions**
    - **Understand how it may (or may not) impact control budget & forecast**

Variances

- Difference between what was originally expected & what actually happened.
  - **Schedule Variance:**
    - **Difference between projected start / finish dates & actual or revised start / finish dates.**
    - **Difference between earned value & scheduled value. Schedule Variance = Budgeted Cost of Work Performed (BCWP) - Budget Cost of Work Scheduled (BCWS).**
      - **A negative Cost Variance indicates activity(ies) is running behind schedule.**
  - **Cost Variance:**
    - **Difference between earned value & actual cost. Cost Variance = Budgeted Cost of Work Performed (BCWP) - Actual Cost of Work Performed (ACWP).**
      - **A negative Cost Variance indicates activity(ies) is running over budget.**

Trends

- In a change management system, a *Trend* is first indication of change that must be tracked & properly dealt with
  - **Initially seen as real or perceived, may later be identified as Deviation (not normally reimbursable) or Change (typically reimbursable in time & or money)**
  - **Cost & Schedule trend charts are used to analyze positive / negative movement, focus team on potential control actions to take**
  - **Timely Communication & Notice are key**

Corrective Action

- Upon analysis of Deviations, Variances & Trends, options explored to:
  - **Improve upon positive trends**
  - **Identify mitigation strategies that eliminate or minimize risk events (ongoing or future)**
  - **Implement remedial actions to reverse & overcome (partially or fully) adverse cost & schedule issues**
- Many potential corrective action paths, often with their own risk profiles, that then become subjective management decisions

4.
Tools & Techniques

First & Foremost

- Your Company / Organization has
  - **Change Management Culture**
  - **Change Management Policies & Procedures**
- Understand differences between:
  - **Your company / organization;**
  - **Individual Contract / Project requirements;**
  - **Clients, Subcontractors & Suppliers; and**
  - **Recommended / Best Practices of AACE & CII.**
- One size does not fit all
- Software should not replace your brain
  - **Proper Change Management requires independent analysis & subjective decisions (guided by automated tools & procedures)**

Logs, Databases & Reports / Graphics

- Change Management Forms, Checklists & Logs
  - **Starting point for documenting & communicating**
    - **What information is key?**
    - **What information is best communicated to various parties?**
  - **Database tools**
    - **Off-the-shelf software tools**
    - **Internally developed / maintained**
  - **Reports / Graphics**
    - **The good, the bad & the ugly**
    - **Great communication tool if only right information to right audience provided**
    - **Starting point for internal & external Notice & Analysis**

Change Status

- All must understand current status of Change to ensure they proceed accordingly
  - **In Development**
    - **ROM estimate in development (cost & schedule)**
  - **Routing**
    - **ROM estimate under internal review (cost & schedule)**
  - **Pending**
    - **Approved internally, awaiting external approval**
  - **Approved**
    - **Internal & external agreement to proceed**
  - **Proceed**
    - **Agreement to go forward on a limited approval basis**
  - **Hold**
    - **Do not proceed further, awaiting further direction (typically external)**
  - **Rejected**
    - **External rejection, no further action required at this time**
  - **Canceled**
    - **No further action required**

Change Justification

- Organizational and/or Contractual requirements will identify basis for justification categories
  - **Typically, for Change Orders**
    - **Significant Health, Safety Environmental issue**
      - **Safe operations, process safety standards, environmental regulations**
    - **Significant Operational issue**
      - **Root is typically a design issue**
    - **Compliance issue**
      - **Regulatory compliance issue**
- Dictates ultimate change classification
  - **Defines which party & to what extent responsible for cost budget & schedule baseline**
    - **Contractually may drive compensation & "penalties"**

Typical Categories & Common Reasons

- Contracts & Practices typically set out a list of
  - **Categories, Common Reasons (examples) & how Funded**
    - **Base scope, Allowance, Contingency, etc.**
- Category & Reason Examples
  - **Budget Shift**
    - **Transfer of moneys between category.**
      - **Change in who does what**
  - **Design Definition**
    - **Correction to technical documents**
      - **Field routing changes caused by construability considerations**
  - **Estimate Adjustment**
    - **Errors & omissions**
      - **Significant change in material prices, labor productivity, wages**
  - **Field Changes**
    - **Differing / Changed site conditions**
  - **Global Changes**
    - **Change in capability, capacity or throughput of plant**
  - **Execution Plan Changes**
    - **Schedule milestone changes**
      - **Change in execution sequence or priorities**
  - **Safety & Operability**
    - **Design no longer safe or has operability issues**
  - **Random Events**
    - **Typically Force Majuere type events**
      - **Contract definitions for Force Maejure risks**

Highly dependent upon contract which governs change management process

PCA: Potential Change Alert

- Often, first “informal” notice of change
  - **Initiation document to be circulated amongst team**
    - **To start process of capturing knowledge & supporting documentation**
  - **Internal routing that often leads to a PCN**
    - **PCA evolves to PCN – Project Change Notices**
- PCA & PCN process & forms highly dependent upon organizations involved
  - **Sophisticated owners**
  - **Sophisticated EPC contractors**

PCN: Potential Change Notice

- Often, first “formal” notice of change
- Every company / organization & many contracts have a standard PCN form
  - **No good if not used**
  - **No good if not properly circulated**
  - **No good if “kept in house”**
  - **No good if not followed through complete change management cycle**
  - **No good if treated as a “check box”**

Change Management Risk Checklists

Risk Issue	Level of Risk	Existence / Occurrence	Mitigation	Resp.	Importance	Testing	Proof
List of "What could go wrong?	Risk is perceived to be: Low, Medium or High	Does it exist? Is it an obligation? How measurable?	Action plans to prevent or mitigate issue	Who performs?	Level of Importance necessary to control or mitigate risk – Low, Medium or High	Will control actions be tested: Yes or No	Test procedure used to verify compliance

Change Management Check Lists

- Descriptive name of change with dates / times
- Description of event & how discovered / communicated
- Type of change (directed, delay, etc.)
- Notice (formal & informal) given (internal & external)
- Identify key participants & roles
- All causes, identifying all affected EPC activities
- Describe impact(s) to ongoing & future work
- Key / relevant documents
- Time & cost impact of lost productivity & disruption
- Contract & schedule milestone issues (LDs etc.)

Schedule Change

- Documentation via
  - **Daily reports / quality reports**
  - **Meeting minutes & other factual recordings**
  - **Progress updates via databases & schedules**
- Analyze & communicate impact of change via
  - **Time impact studies (non-CPM schedule tools)**
  - **TIAs – Time Impact Analysis**
    - **In the broadest sense of the term**
    - **Proactive resolution via schedule fragnets & what-if mitigations**
    - **As-built, Windows & other analysis techniques**

Cost & Schedule Considerations

- Cost & Schedule are Siamese Twins
  - **They were "born" together**
    - **For every cost change there is a potential schedule impact**
    - **For every schedule change there is a potential cost impact**
  - **They cannot be surgically separated**
    - **Thus, need for EVMS implementation**
- "Off Critical Path" considerations
  - **Disruption costs at minimum**
  - **Cumulative schedule impact potential**

Management Styles for Change Management

- Passive versus Proactive
  - **Newspaper reporter versus cost & schedule management professional who is proactive when identifying trends, issues, analyzing & forecasting**
    - **"It's a happening"**
    - **"The thousand mile stare"**
  - **Passive often results in**
    - **Scope creep**
    - **Late identification & formal notice**
    - **Inability to segregate cost & schedule impacts**
    - **Risk ignored until too late to mitigate**
    - **Team is always reacting, on their heels, forced into defense**
  - **Proactive allows team to**
    - **Focus on critical drivers for success**
    - **Reduces risk exposure & ultimate impacts of risk**
    - **Team is a true team & moving forward smartly**
    - **Successfully move to next projects (not a 'one-off' bad result)**

Must be thinking & planning ahead of everyone else

Perspectives Are Important

- Preceding Change Management process is mostly from EPC contractor's perspective
- While Owner / Client's perspective may be in alignment with desired end result (successful completion) they will see things differently
  - **Defined & perceived contractual risk**
    - **Base scope includes some 'expected change'**
    - **Responsible party**
  - **Contingency ownership & uses**
    - **Cost & Schedule (float)**
  - **Prerogative to initiate or impose change**
  - **Value of change event**
    - **Cost, Price & Risk**
    - **No Cost (tradeoff) & No Impact (cost, schedule) change**

Concluding Thoughts

- In projects, little is constant, but it is certain that tomorrow will be different from that planned
  - **Change == Risk that must be accounted for & mitigated**
- Successful project completion occurs only when project team is ready, willing & able to deal with constant & evolving change
- To gain upper hand on change & make it work to project's benefit requires robust change management
  - **Understand what's in baseline (cost & schedule) & what's not**
  - **Embrace change proactively by using right tools to identify, document, monitor, forecast & communicate**
    - **Change & attendant risk to cost & schedule can only be mitigated by early identification & focus on practical solutions**
  - **Take a disciplined approach to accepting & incorporating change**
    - **Full-bodied change management must be a common organizational goal**
  - **Communicate early & often to key stakeholders**

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