

# **Cost Methodology**

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# Top-down Vs. Bottom-up Estimates



- **Top-down Estimate**
  - ROM by nature
  - Contingency & Cost by *Feel — Expert Judgment*
  - Often used to establish budgets
  - Global evolution
  - Major Systems WBS
- **Bottom-up Estimate**
  - Detailed by nature
  - Deterministic Cost & Contingencies
  - Often used to justify budgets
  - Incremental Evolution
  - Detailed level WBS

# DOE's Got Project *Religion*



- **National Research Council Report**  
—*Improving Project Management in the DOE*
- **Recent projects of interest — NIF**
- **Establishment of OECM within DOE CFO**
- **Adoption of O413.1**
- **Development of new Project Management Manual**

# The *ROM* Trap



- ROM means
  - ROUGH* Order of Magnitude
  - NOT
  - Right on the Money*
- Any number given is taken as a *Not to Exceed*
- The cost is always the second question
  - #1 What is it?
  - #2 How much does it cost?
  - #3 How long will it take?

# ***We're From the Government and We're Here to Help You***



- DOE O413.X may actually help against the *trap*
  - CD-0 Mission Need (Start CDR)
  - CD-1 Approve Preliminary Baseline Range (CDR)
  - CD-2 Establish Baseline Budget for construction
  - CD-3 Approve start of construction
  - CD-4 Start of Operations
- DOE gives tacit acknowledgement to the *ROM Trap*
- Establishment of ranges rather than numbers

# Estimation Collection Approach



- The ROM estimates developed within the study are by definition Top-down
  - Systems / requirements still in flux
- No single number should be generated only a range
  - Uncertainties are forgotten
  - Contingencies are discounted
  - Caveats are ignored
- WBS segregated into systems for facilitating *Expert Judgment*
- WBS should be deliverables, not activities, driven

# Stating the Obvious



- A Top-down estimate should have a very limited number of digits reported
- The WBS should be adapted to facilitate the generation of the *Expert Judgment comparisons*
- Typically a three-part WBS
  - R&D (at this time very detailed)
  - CD development (more summary)
  - Construction major systems/subsystems
    - *System is like X, except that . . .*

# Listening to Dictums



- *Assume nothing — Trust no one.*
- *Trust, but document.*
- *What you don't know will hurt you.*
- *The same work under the same conditions will be estimated differently by ten different estimators or by one estimator at ten different times.*
- *What isn't written isn't.*



# What Should Be the Outcome



- ROM Range by systems / major phases
- Documented assumptions
- Basis of analogy / *Expert Judgments*
- Initial identification of major risk items
- Adequate contingency / uncertainties
- Determination of major cost drivers

# What About the R&D Phase?



- Represents *real* money therefore represents *real* concern
- Clear SOW / WBS with easily identified milestones / achievements
- Opportunity for Collaboration to prove its *capability* to the DOE
- The challenge of maintaining focus  
*Directed results vs. Scientific Knitting Society*