



**TRUE PROGRAM
SUCCESS**

'05

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The Zen of ICE

ICE and Management Acceptance

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"Don't seek reality, just put an end
to opinions" - Sheng-ts'an

PRICE

Agenda



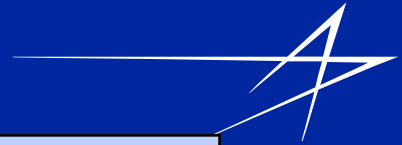
- **LM Process and ICE Organization**
- **Terminology**
- **Process**
- **Validation/Reconciliation**
- **Calibration**
- **Disclosure**
- **Hierarchy**

Risk Management

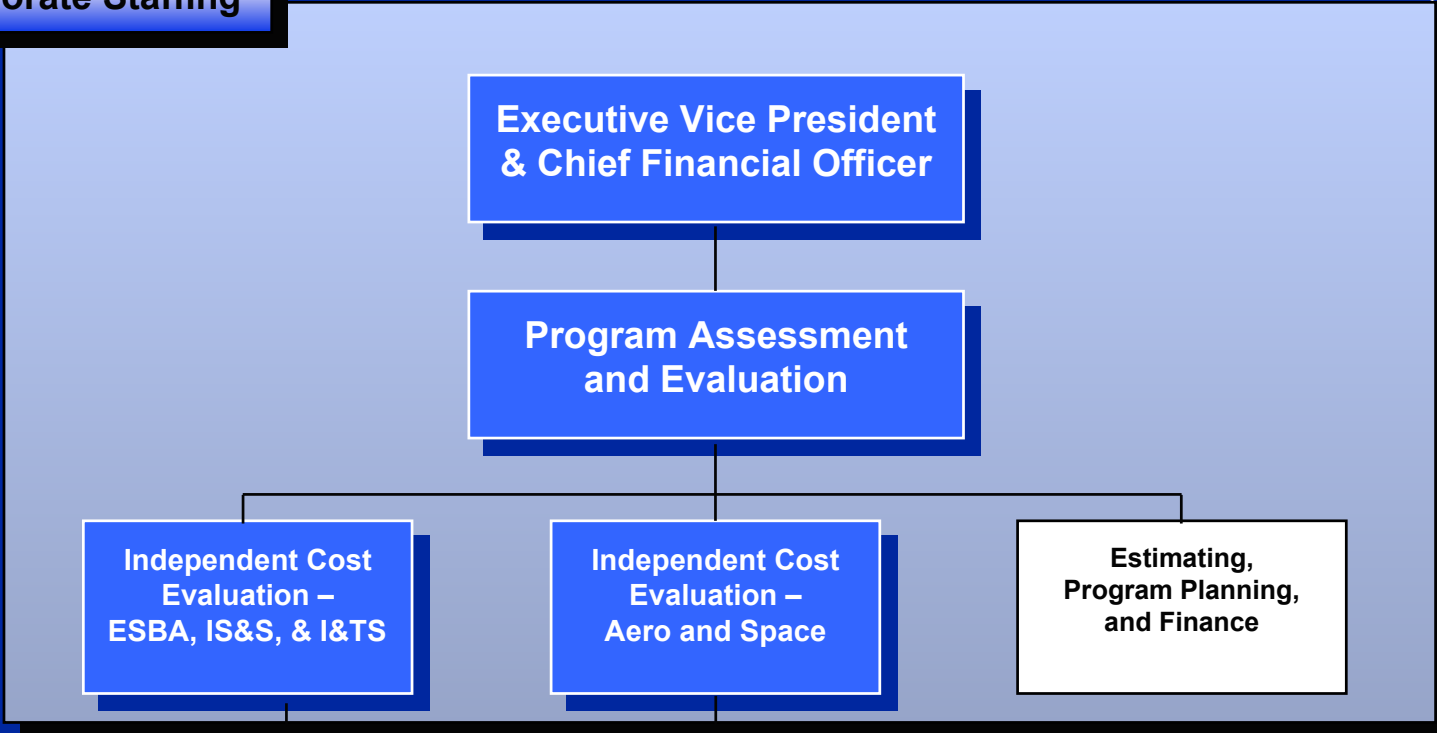


Policies / Practices in Place to Manage Enterprise Risk

ICE Organization - Corporate



Corporate Staffing



Business Area Staffing





Terminology

- **Statistical terms**

- **Mean** = average; the sum of all observations divided by the number of observations
- **Median** = the value above or below which lie an equal number of observations
- **Mode** = the most frequently occurring value in a set of observations
- **Sigma** = standard error/deviation (~34% of area to one side of the mean in a normal distribution of observations)

- **ICE terms (a practical use of statistics)**

- **Nominal** = the "best fit" through a set of representative observations; 50/50 probability of remaining cost at a point in time; "most likely" cost outcome.
- **Conservative** = 80/20 probability; ~ 1 sigma deviation for remaining risk

"Water which is too pure has no fish"
– Ts'ai K'en T'an



ICE Process - General

- ICE estimates nominal (50/50) and conservative (80/20) cost outcomes for a given project by using comparative project and historical data (e.g., costs, relationships, risks, trends) to determine:
 1. The "likely" cost to complete;
 2. The risks around that cost; and
 3. The magnitude of the risks representing an 80/20 probability for the given scope.

"In murky water, find fish through ICE"
- Anonymous

ICE Process - Nominal



- **For a new bid/program, the nominal is developed using representative "best fit" data**
 - Actuals from representative, completed areas/programs regressed, adjusted and used to estimate the "most likely" outcome
 - "Best fit" of actuals is 50/50
- **For an ongoing program, the nominal evolves from similar to "best fit", to program-specific cost-estimating relationships (CERs) as the program assumes a character of its own**
 - Program actual relationships/trends = 50/50 forecast
 - CERs from other programs replaced
- **Actuals are 100/0 representation of the past, but ~ 50/50 representation of the future (as normalized for "best fit", trends and other anomalous events)**

"Be aware of sticking head in sand when holding feet to fire."

– Anonymous



ICE Process - Conservative

- For a new bid/program, the conservative is developed by assessing the risks around the nominal and calibrating to historical 1-sigma spread
- As the program assumes a life of its own, the conservative liquidates risk for actual performance while reassessing "to-go" risk based on representative life cycle risk
- Occasionally "best fit" and "sigma" may be untenable or indeterminable; ICE will notify management, explain why, and detail what assessment of risk was used.

"Man can learn nothing except by going from the known to the unknown."

– Claude Bernard

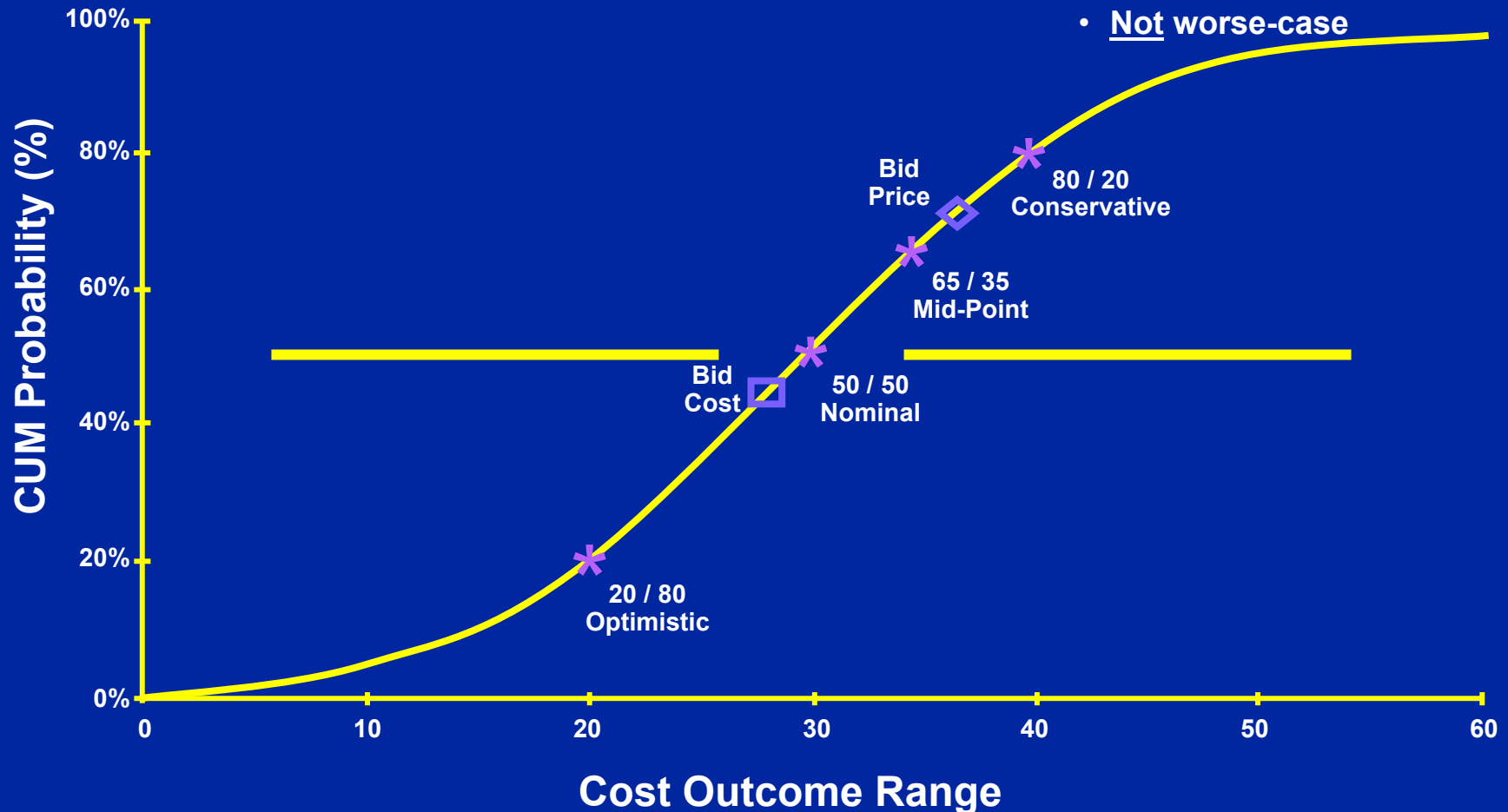


Establishing ICE Risk Range

- **AGGRESSIVE (20/80)**
- 80% Chance of an overrun

- **NOMINAL (50/50)**
- Equal chance to underrun or overrun.

- **CONSERVATIVE (80/20)**
- Will be underrun 4 out of 5 occurrences
- Not worse-case





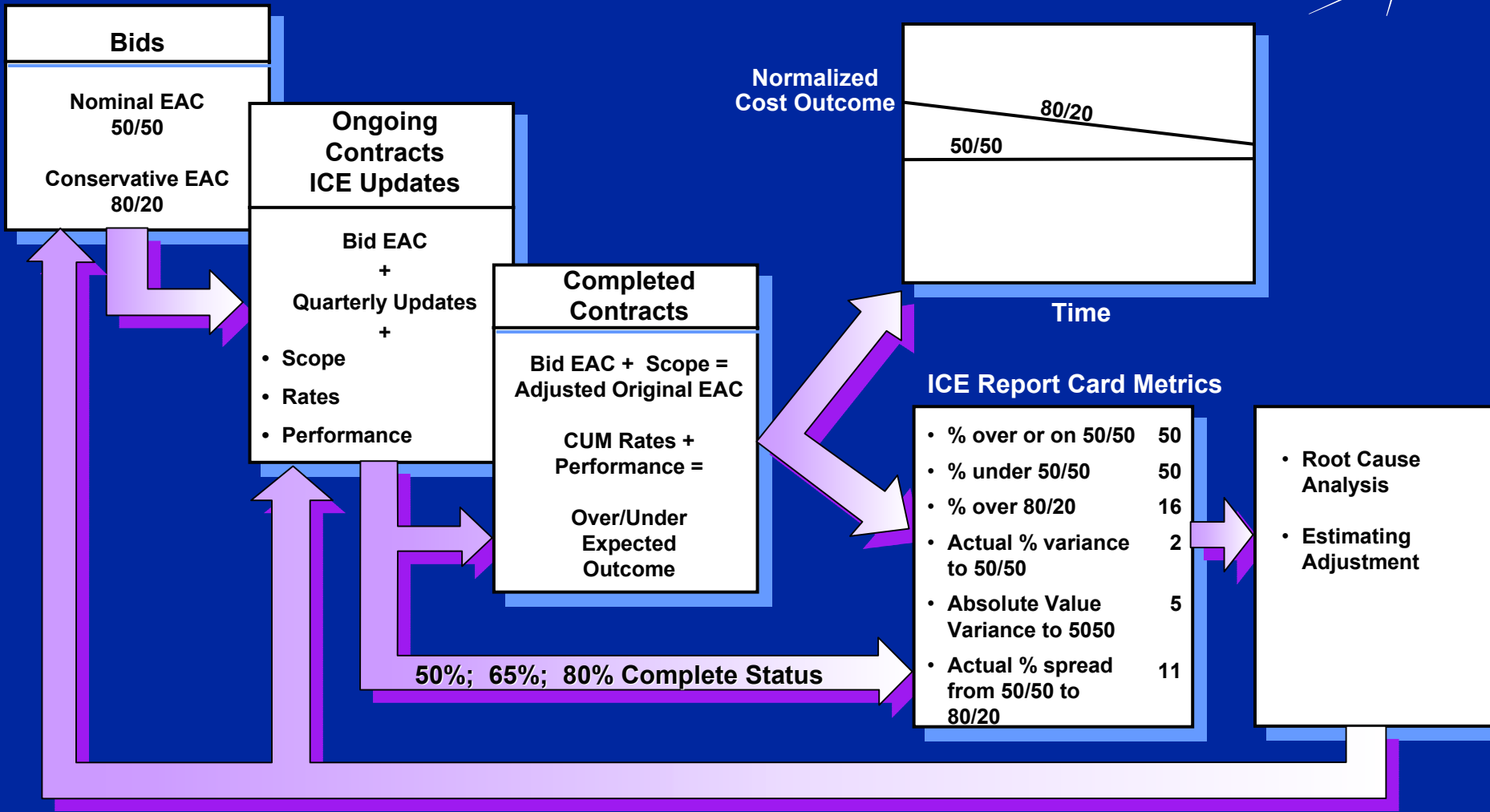
Validation & Reconciliation

- **Use estimating approaches different from the primary estimate**
- **Perform "sanity checks" to gain confidence in estimate**
- **Compare the differing estimates:**
 - **Reconcile**
 - **Understand**
 - **Explain**

"Use of one data point is astrology; two is coincidence; three or more is scientific."

– **Marv Bullock**

ICE Calibration & Adjustment



"To see what is in front of one's nose needs a constant struggle."
 – George Orwell

ICE Disclosure

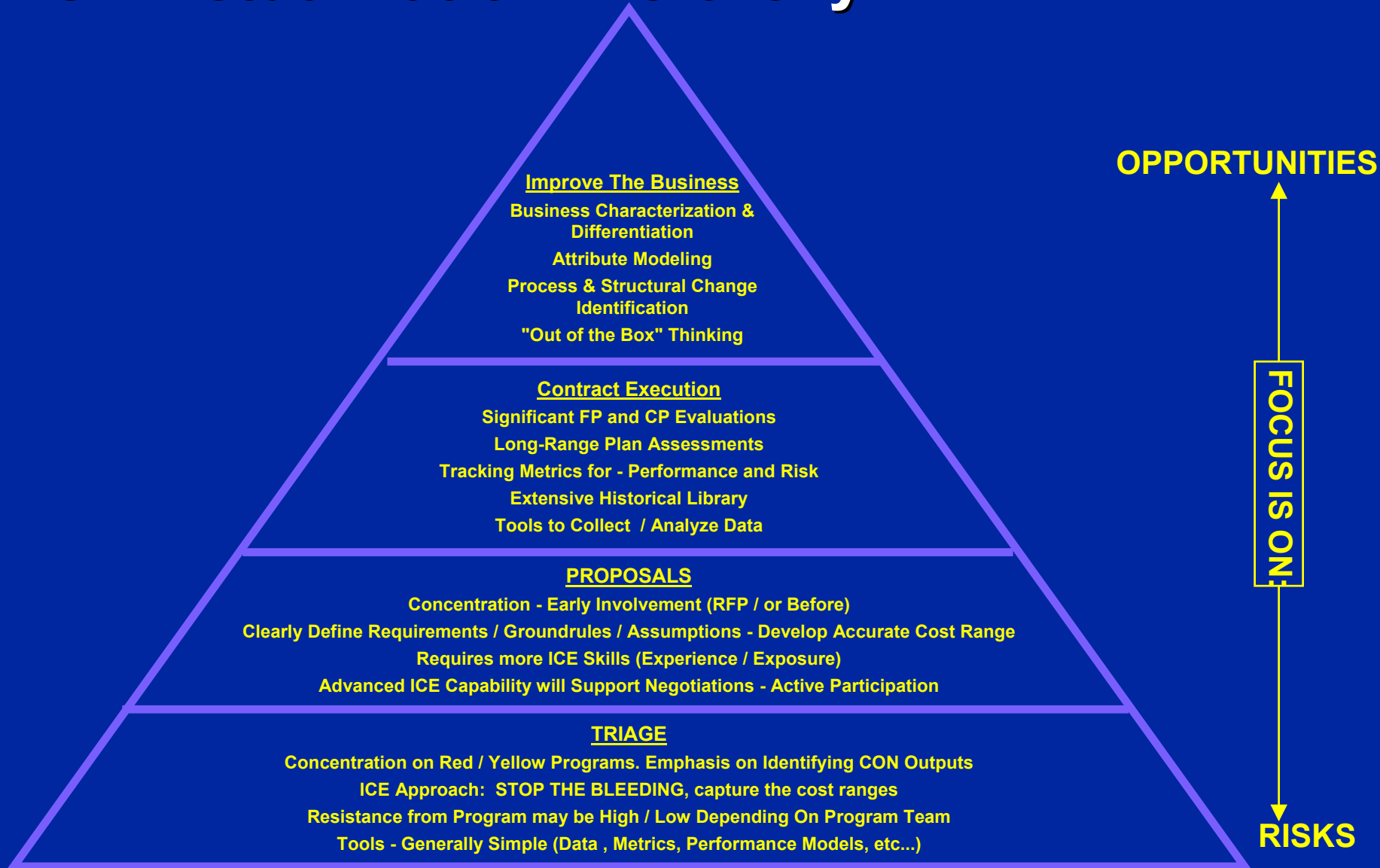


- **In ensuring compliance to the Truth in Negotiations Act, one should:**
 - **Disclose the preparation of ICE assessments;**
 - **Disclose any relevant verifiable/factual data, such as auditable cost estimating relationships used; and**
 - **Disclose (and reconcile to cost proposals) other estimates that may have been prepared, such as functional estimates, signups, commitments, budgets, etc., in order to improve the quality and credibility of proposals.**

"Should you desire great tranquility,
prepare to sweat white beads"

– Hakuin

ICE Actualization Hierarchy





"Zen is not some kind of excitement,
but merely concentration on our usual everyday routine."
- Shunryu Suzuki

"ICE is not magic, merely applied study of our usual and
unusual work routine."
- Anonymous

