

Draft EFCOG Process for Developing Leading Indicators

Energy Facility Contractors Group
(EFCOG)

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September 29, 2008

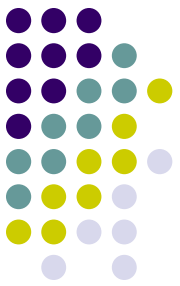


Plan for Developing EFCOG Leading Indicator Guidance



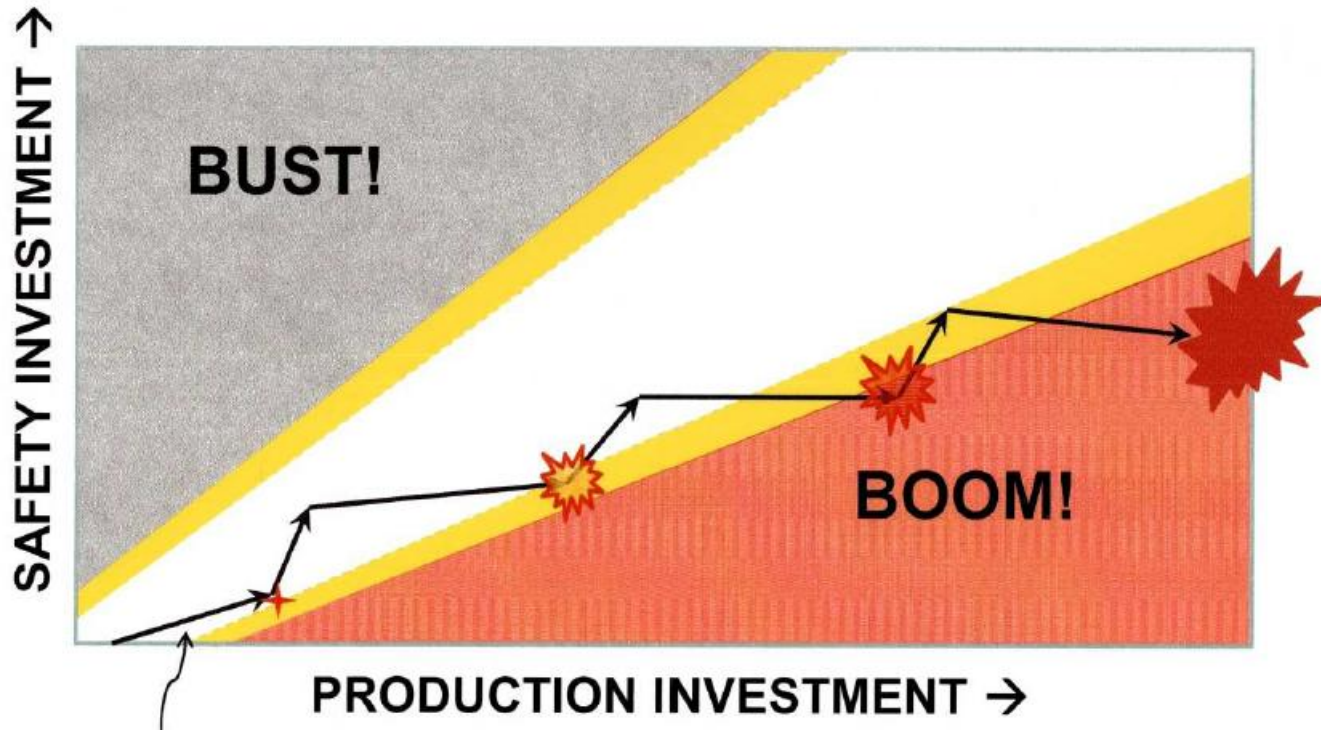
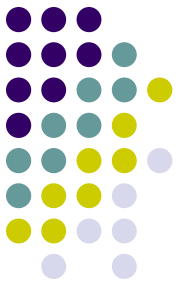
- Consolidate understanding of DNFSB expectations on leading indicators
- Develop EFCOG approach to leading indicator development
 - EFCOG CAWG lead coordinator
 - Collect existing site indicators through EFCOG working groups
 - Share lessons learned on “metrics that work . . . and why”
 - Identify high-level bins
- Develop presentation for DNFSB on EFCOG approach
- Develop EFCOG guide for leading indicators

EFCOG Process for Leading Indicators



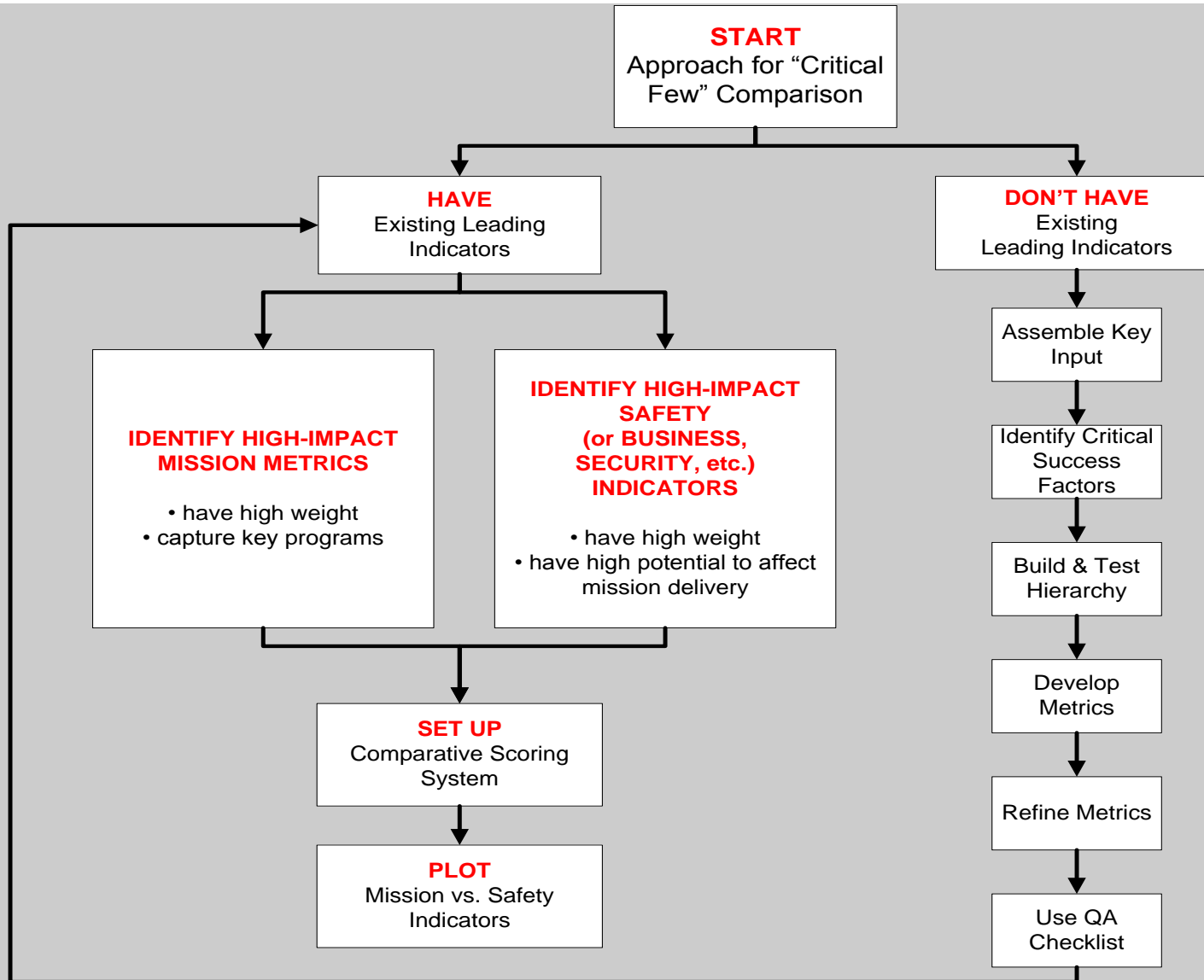
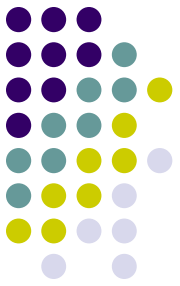
- Develop draft approach for EFCOG for developing effective leading indicators by September 30, 2008.
- Other EFCOG Working Group chairs provide comment in preparation for a discussion with DNFSB by the EFCOG chair in early November 2008.
- Draft approach builds on
 - Processes developed by recognized industry consultants
 - DNFSB suggestions on developing leading indicators

A Model for Balanced Metrics

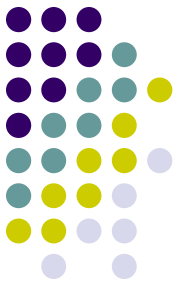


The slope and direction of this line is often driven by the organization's desire to "economically optimize" the relative cost of safety in the activity. As safety deficit increases, slope may go negative, leading to more rapid degradation.

Draft Approach Overview

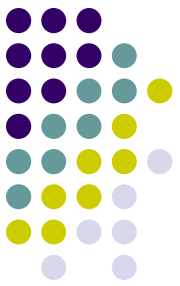


Have Existing Leading Indicators



- Key metrics involving Mission or Program Delivery
- Leading indicators of Safety, Security, or Business with potential to affect Mission delivery
- Generally, these previously developed metrics
 - Have highest relative “weight”
 - Are likely to impact key deliverables
 - Have a common performance score methodology

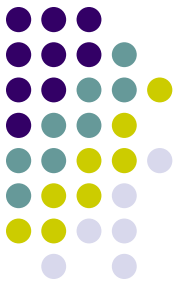
Sample Approach – Mission



Mission - Related Metrics		Properties
WP Predictive Capability	LANL Overall	▼
WP Stockpile Responsibilities	LANL Overall	▼
WE Weapons Systems	LANL Overall	▼
WE Engineering Technology	LANL Overall	▼
SMS Financial Management (Group)	LANL Overall	▼
SMS Performance (Group)	LANL Overall	▼
SMS Quality (Group)	LANL Overall	▼
Weapons Infrastructure Status	LANL Overall	▼
Weapons Program Milestone Status	LANL Overall	▼
1.1.1.2 Nonproliferation R&D (Group)	LANL Overall	▼
1.1.1.3 Nonproliferation and Security T	LANL Overall	▼
1.1.1.5 Pu238 (Group)	LANL Overall	▼
1.1.2.2 International Technology (Grou	LANL Overall	▼
SABRS Qualification Unit (PBI 4.3) - Ci	LANL Overall	▼
Disposition 2250 Rad Sources (PBI 4.	LANL Overall	▼
ST&E LANSCE-R	LANL Overall	▼
ST&E User Facility CINT	LANL Overall	▼
ST&E User Facility Lujan	LANL Overall	▼
ST&E Cognizant System Eng. Staffing	LANL Overall	▼
ST&E LDRD Strat. Invest. Plan	LANL Overall	▼
ST&E External Reviews	LANL Overall	▼
ST&E Non-Fed. WFO Process Improv	LANL Overall	▼
ST&E Post-Doc Fellowship Program	LANL Overall	▼
ST&E Capability Reviews	LANL Overall	▼

- Identify “high impact” metrics in Mission and ST&E
 - Limited number of key metrics
 - Most heavily weighted
- Metrics that are most representative of programmatic and research activity

Sample Approach – Safety



Safety - Related Metrics		Properties
POTW Schedule Compliance	LANL Overall	
Preventive Maintenance Completion	LANL Overall	
Improve Mean Time to Repair Fire Sys	LANL Overall	
Improve Fire Protection Impairments	LANL Overall	
Formality of Operations (FoO) Implem	LANL Overall	
Stretch - Accelerate FoO Implementati	LANL Overall	
Upgrade SS SDDs	LANL Overall	
DSA Submittals	LANL Overall	
DSA Quality	LANL Overall	
Crit Safety Improvement Plan	LANL Overall	
Injury/Illness - DART Cumulative Perfo	LANL Overall	
Injury/Illness - TRC Cumulative Perfor	LANL Overall	
Electrical Severity Index	LANL Overall	
Radiological Event Reporting Index	LANL Overall	
RP Observation Performance	LANL Overall	
ALARA Goals - Individual Dose	LANL Overall	
ALARA Goals - Collective Dose	LANL Overall	
Management Champion Participation	LANL Overall	
LIMITS Cat 1 Open Action Status	LANL Overall	
LIMITS Cat 2 Open Action Status	LANL Overall	
LIMITS Cat 3 Open Action Status	LANL Overall	
Mgmt. Assess. On Plan	LANL Overall	
Improvement in MTSE	LANL Overall	
Significant Event CAP Status	LANL Overall	

- Identify “high impact” Safety-related indicators
 - Limited number of key metrics
 - Most heavily weighted
 - Most likely to have potential impact on Mission delivery
- Same methodology can be applied to other operational areas (Business, Security, etc.)

Develop Comparative Method



MISSION

Metric	LANL Overall
WP Predictive Capability	LANL Overall
WP Stockpile Responsibilities	LANL Overall
WE Weapons Systems	LANL Overall
WE Engineering Technology	LANL Overall
SMS Financial Management (Group)	LANL Overall
SMS Performance (Group)	LANL Overall
SMS Quality (Group)	LANL Overall
Weapons Infrastructure Status	LANL Overall
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ST&E Capability Reviews	LANL Overall

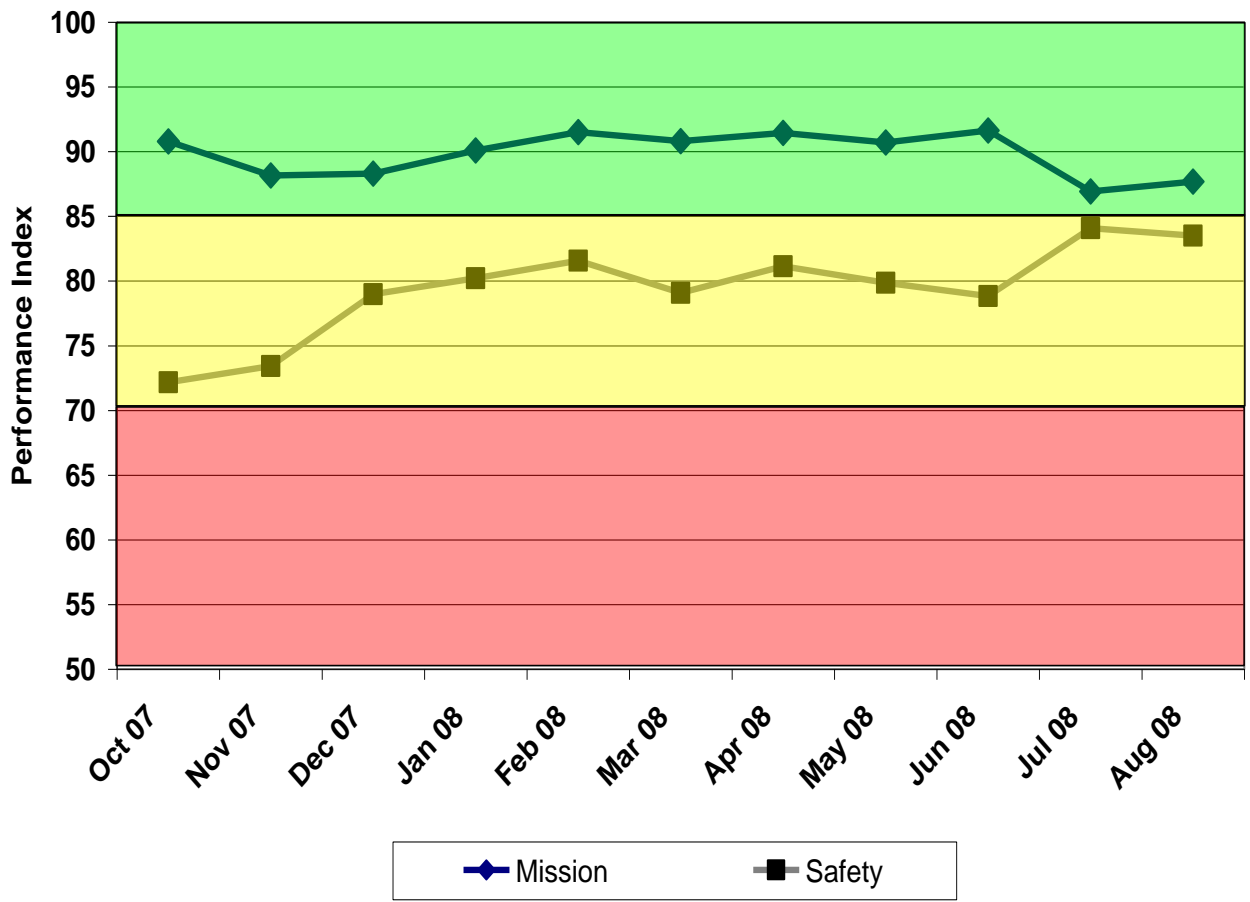
Establish a common scoring methodology for the two sets of metrics.

1. Assign a numerical equivalent to the color/performance rating for each metric.
2. Develop an overall performance index for Mission and for Safety.
3. Plot the Mission and Safety indices for a given time period (e.g., month, quarter)

SAFETY

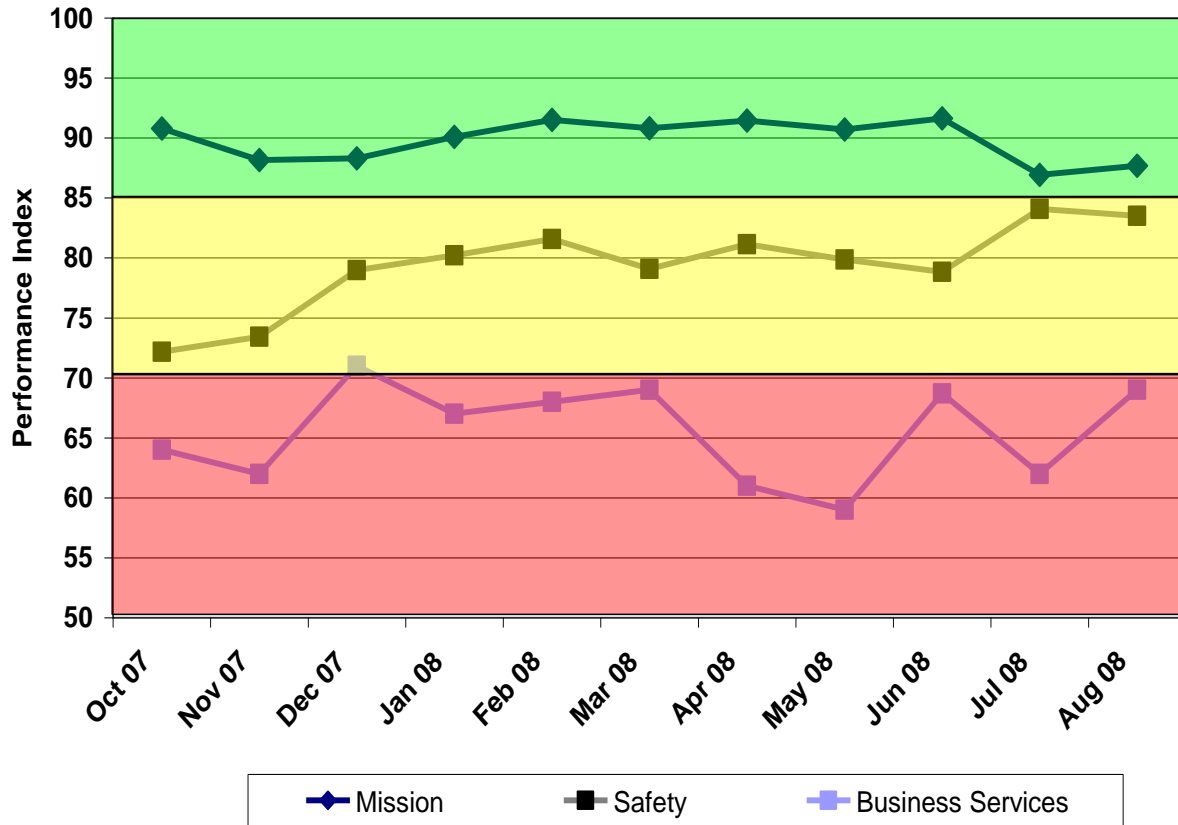
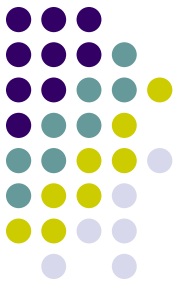
Metric	LANL Overall
POTW Schedule Compliance	LANL Overall
Preventive Maintenance Completion	LANL Overall
Improve Mean Time to Repair Fire Sys	LANL Overall
Improve Fire Protection Impairments	LANL Overall
Formality of Operations (FoO) Implem	LANL Overall
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LIMITS Cat 3 Open Action Status	LANL Overall
Mgmt. Assess. On Plan	LANL Overall
Improvement in MTSE	LANL Overall
Significant Event CAP Status	LANL Overall

Plot Mission vs. Safety



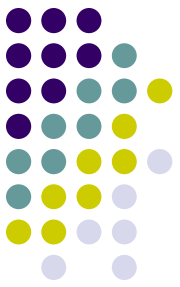
- Before taking action, ask these questions:
 - Does the plot represent reality?
 - Do you have the right metrics?
 - Is the scoring accurate?
- If you believe the plot is accurate, ask these questions:
 - Are there any trends?
 - What is driving performance?
 - What action should be taken?

Plot Mission vs. Other Indices



- Chart performance indices for other support functions, as necessary
 - Security
 - Business Services
 - Environmental
- Use same methodology for plotting and interpreting other operational areas

Don't Have Existing Leading Indicators



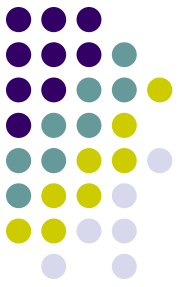
Metric Development Process

- 1) Assemble key input
- 2) Identify critical success factors
- 3) Build and test metric hierarchy
- 4) Develop metric characteristics
- 5) Refine performance measures
- 6) Use quality checklist



It's only 6 steps!!!

Step 1: Assemble Key Input

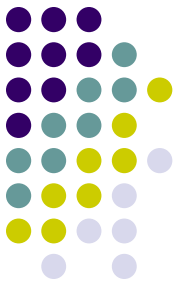


- **Goals**
- **Multi-year strategy/plans**
- **Contractual commitments**
- **Programmatic milestones**
- **Customer needs and expectations**
- **Key deliverables**
- **Key processes**
- **Documented problem areas**



The above materials will aid in developing metrics structure

Step 2: Identify Critical Success Factors

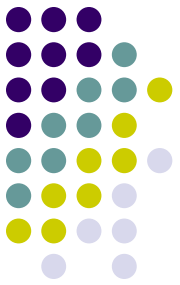


- Meet with management, senior staff, subject-matter experts, process owners, and other stakeholders knowledgeable of key input
- Discuss “We’ll know we’re successful (i.e., our process is functioning effectively) when . . .”
- Identify those elements necessary to ensure program or operational success, or that put success at risk (i.e., critical success factors or CSFs)
- Characterize CSFs in terms of functions rather than organizations
- Prioritize list

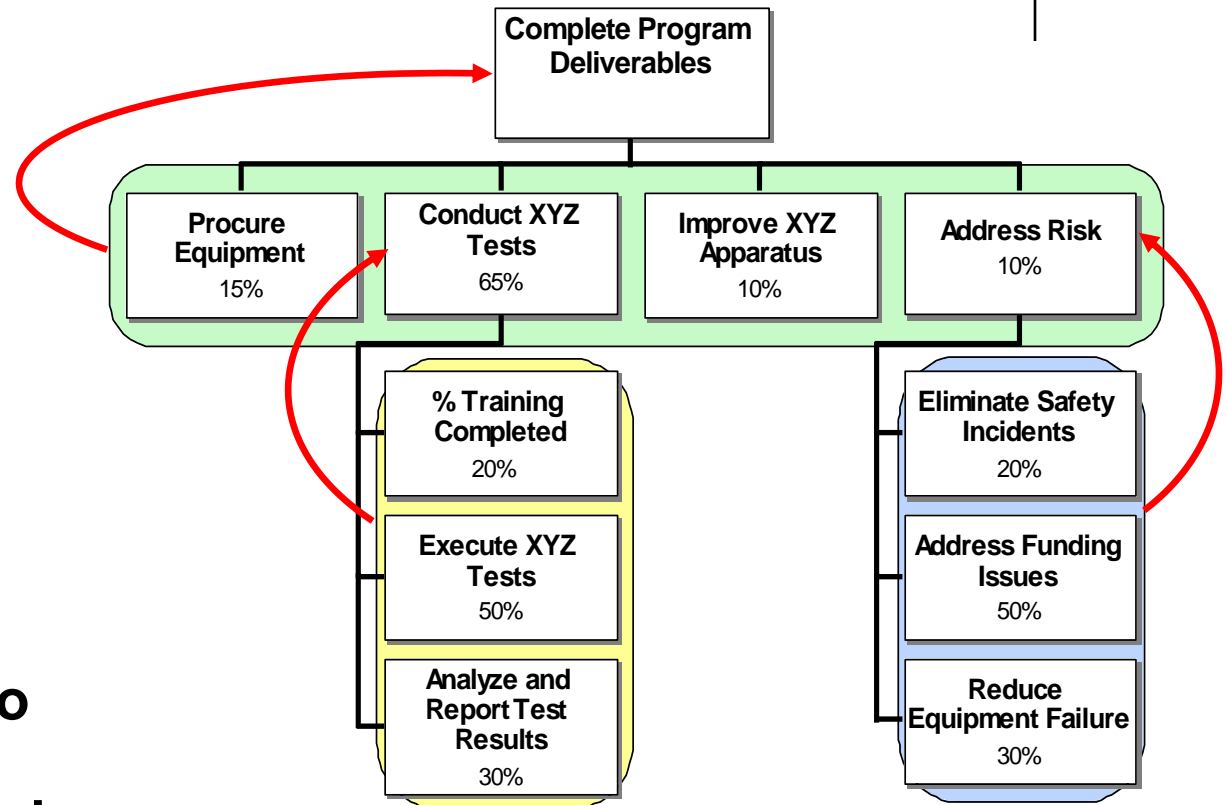


Index cards or a whiteboard can be used to brainstorm CSFs

Step 3: Build and Test Metric Hierarchy

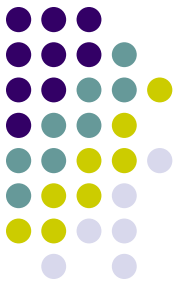


- Construct a hierarchy of related critical success factors
- Ensure that each tier passes the necessary-and-sufficient test
- Assign weights to each CSF based on priority or need for “management attention”



Each tier must pass the necessary-and-sufficient test

Step 4: Develop Metric Characteristics



Basic Metric Characteristics

Weight: Assigned based on relative importance of measure. Weights for any given tier must add up to 100%.

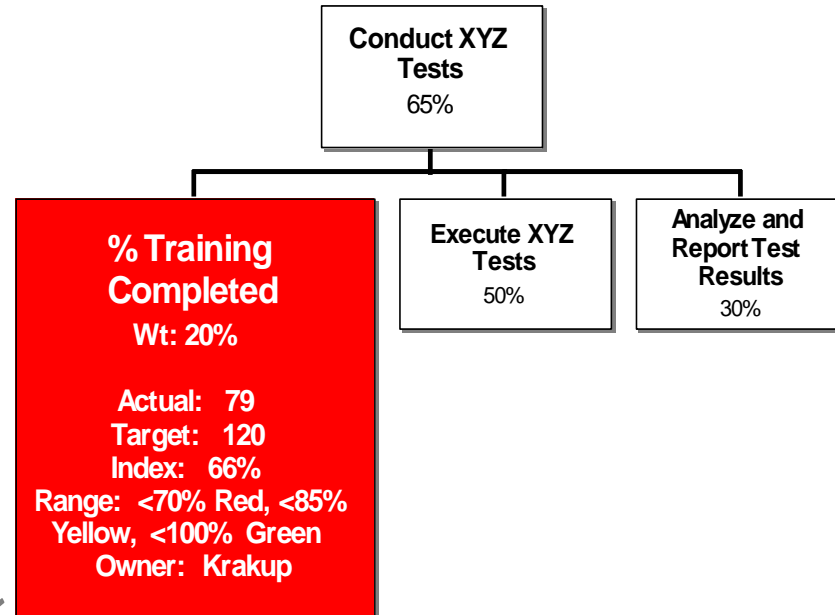
Actual: Indicates the data observed or collected during the reporting period. Expressed in measure units, i.e., days, \$, numbers, %, etc.

Target: Indicates the desired performance for the specified period. Expressed in same measure units as Actual.

Index: Indicates the Actual divided by the Target. Expressed as a percentage value.

Performance Range: Provides the scoring basis for a given index, e.g., Red, Yellow, or Green.

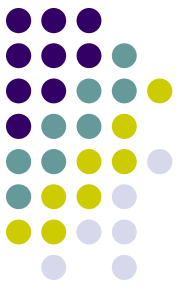
Owner: Individual responsible for influencing the behavior of the metric.



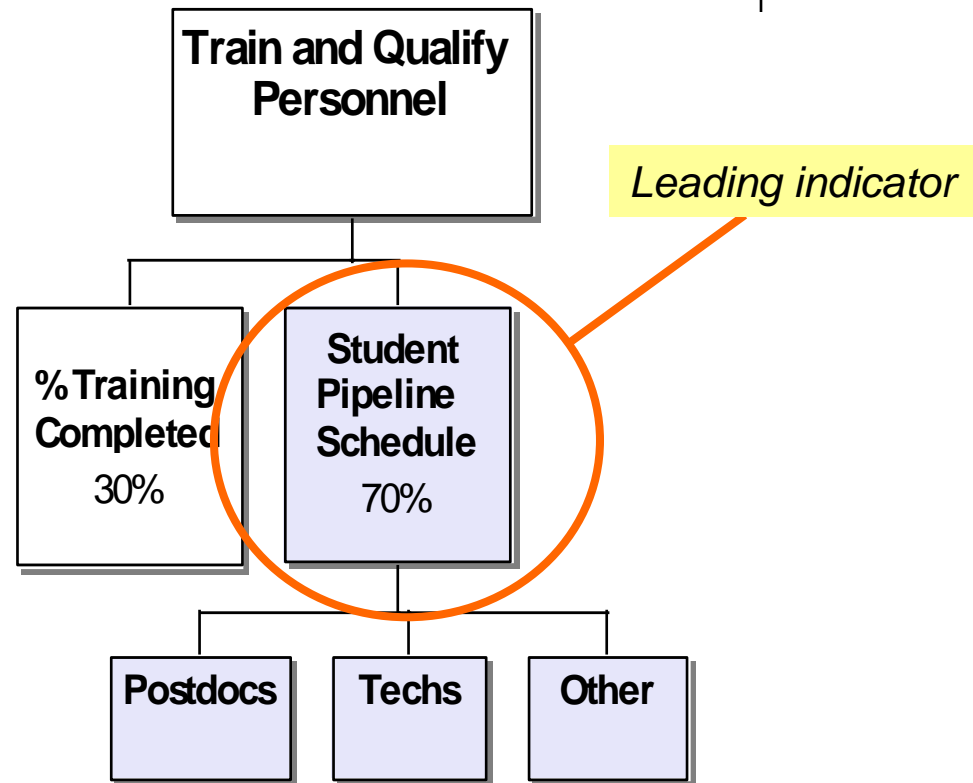
% Training Completed is a performance measure — but is it “actionable”?

Step 5: Refine Measures

Lagging vs. Leading



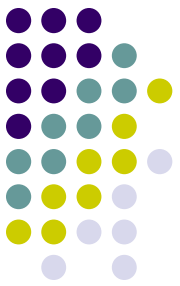
- **Lagging indicators**
 - *Easiest to identify*
 - *Show past performance*
 - *Lack predictive power*
- **Leading indicators**
 - *Performance drivers*
 - *Often include process metrics*
 - *Show how targets will be achieved*



A leading indicator can provide early warning for a lagging indicator and is more “actionable”

Step 5: Refine Measures

Lagging vs. Leading (cont.)

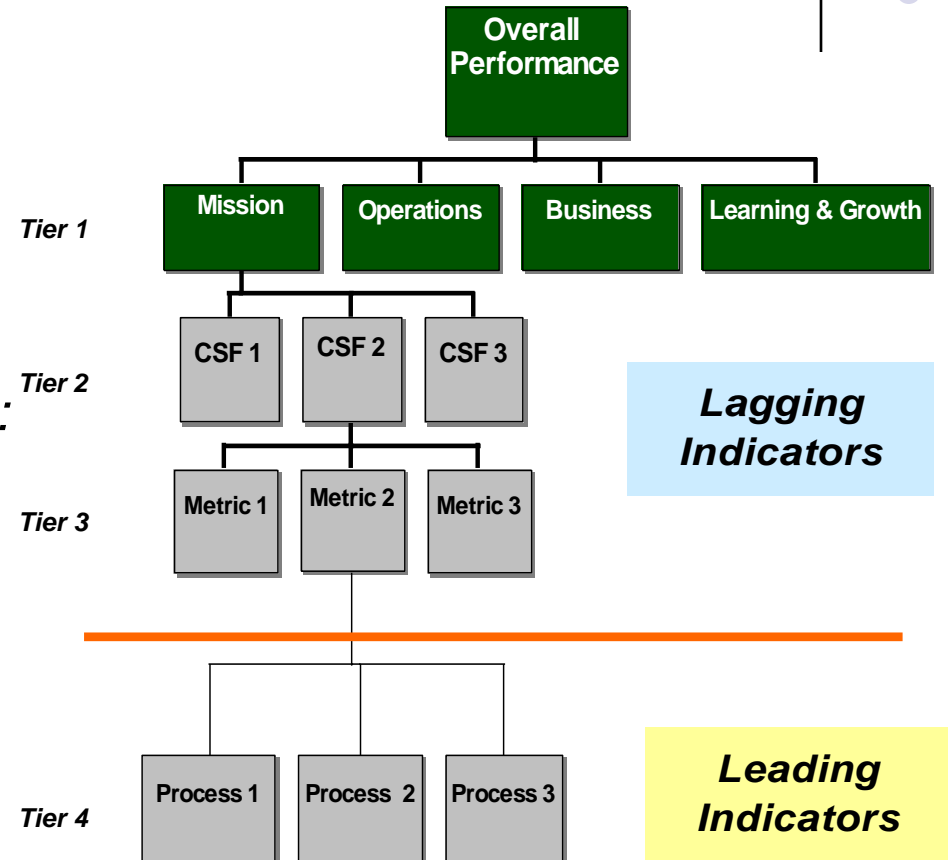


- **Lagging indicators**

- *Tier 1 CSF: not actionable*
- *Tier 2 CSF: more developed; not actionable*
- *Tier 3 Actionable Measures: set stage for process improvement metrics*

- **Leading indicators**

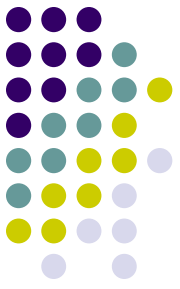
- *Tier 4 Focused Measures*
- *Monitor progress*
- *Actionable*



Process metrics are often at the bottom of the CSF hierarchy

Step 5: Refine Measures

Efficiency vs. Effectiveness

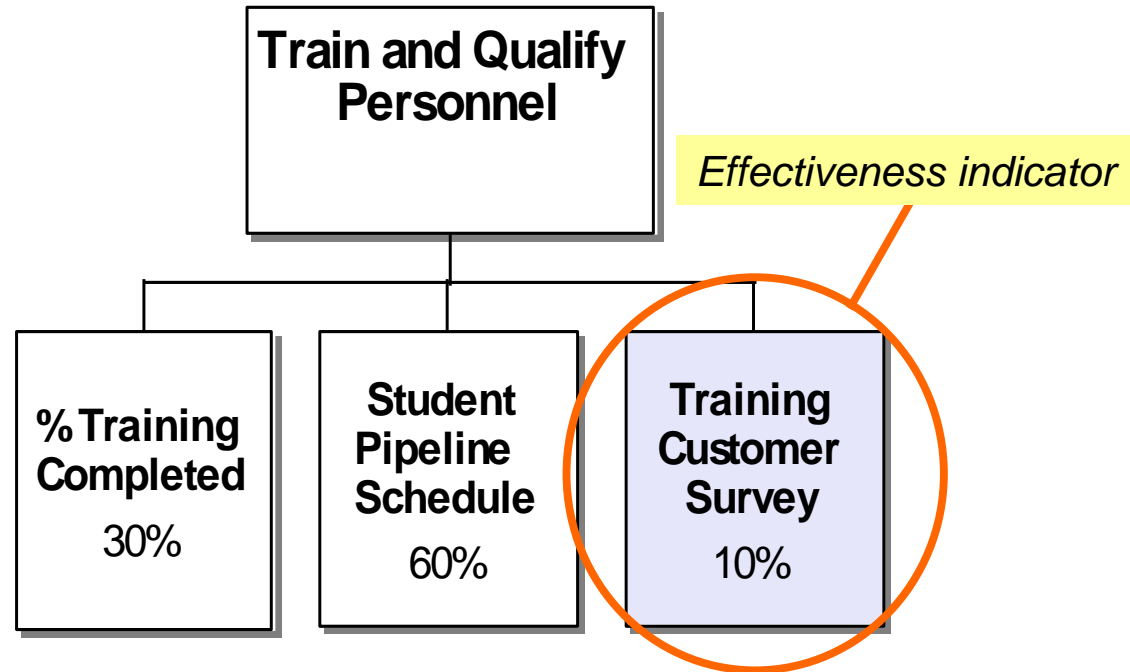


- **Efficiency indicators**

- *Generally indicate cost, time, or number*
- *Often show activity completion or cycle time*

- **Effectiveness indicators**

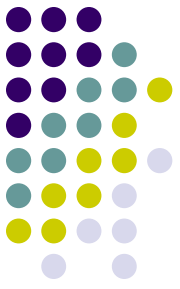
- *Indicate the quality or result of an activity or operation*
- *Show how well an activity addresses a problem or issue*



A customer survey metric can provide an indicator of an activity's effectiveness

Step 5: Refine Measures

Internal vs. External Benchmarks

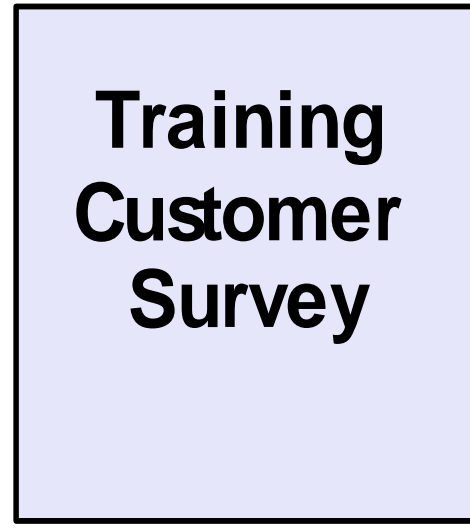


- **Internal benchmark**

- *Target set by similar operation or activity*
- *Often uses historical data (e.g., previous fiscal year average, etc.)*

- **External benchmark**

- *Target set by external operation (e.g., DOE average)*
- *Use care to select similar type/risk of activity*



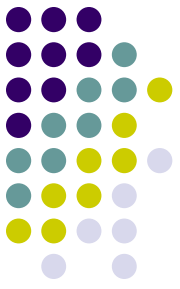
Internal benchmark of 80% satisfaction based on historical data for same activity

External benchmark of 95% satisfaction based on industry best practice

An external benchmark can provide an objective target of performance — while the internal benchmark may be more realistic

Step 5: Refine Measures

Short-term vs. Long-term

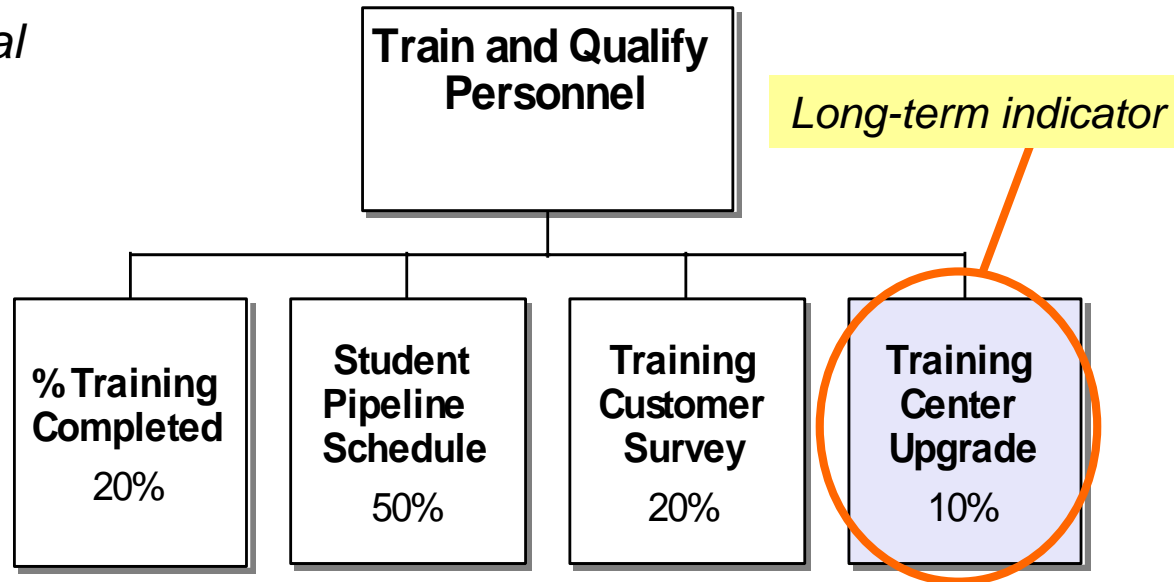


- **Short-term indicators**

- *Often show status of fiscal year deliverables*
- *Examples are major program milestones*
- *Change with greater frequency*

- **Long-term indicators**

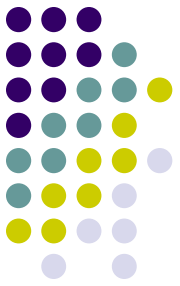
- *Reflect mission, strategy, and goals*
- *Provide status of future sustainability*



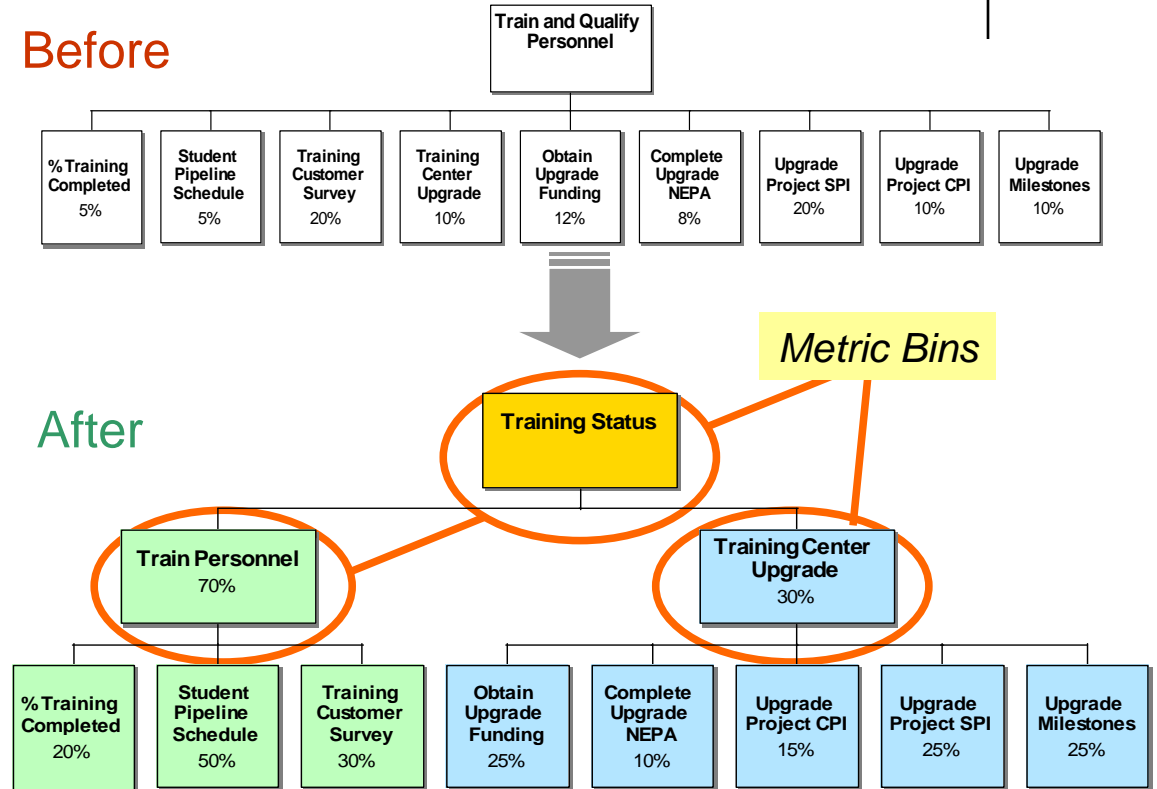
A long-term indicator may reflect the activity's future sustainability

Step 5: Refine Measures

Number of Metrics

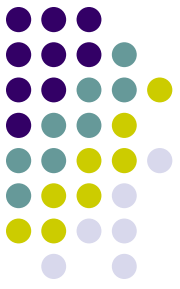


- **Rule of Thumb:** More than 6 CSFs/metrics on a single tier may indicate problem
- The rationale for weighting, logic of relationships, etc. becomes difficult to understand
- Bins should be of manageable size and contain related metrics



A long tier of metrics should be broken into smaller bins

Step 6: Use Quality Checklist



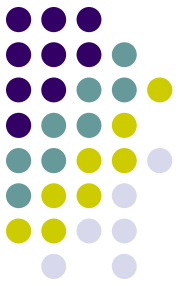
Does the metrics structure . . .

- Translate mission into actionable measures?*
- Show where and how to improve performance (process)?*
- Capture and measure known “weak” areas?*
- Track what internal and external customers care about?*
- Provide leverage in changing behavior or process criteria?*
- Assist in holding people accountable?*
- Help manage cross-functional processes?*
- Provide benchmarks to evaluate or compare performance?*
- Help build your capabilities for the future?*



A hierarchy that does not have a high percentage of “yes” answers should be revised

The Big Question



***Am I using these
metrics to manage?***

- ***If yes, keep them***
- ***If no, modify or eliminate***