Developing Metrics to Facilitate Quality System Maturity and Accountability

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Louis Blume, U.S. EPA Great Lakes National Program Office

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U.S. EPA Region 6 QA Conference – Dallas, Texas
Agenda

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<th>Topic</th>
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<th>Time Frame (minutes)</th>
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<td>Welcome and introductions</td>
<td>Marion</td>
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<td>“Stages of Quality” paradigm</td>
<td>Lou</td>
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<td>Proposed Metrics and Next Steps</td>
<td>Marion &amp; Lou</td>
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<td>Open forum for discussion</td>
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Disclaimer: The views expressed in this presentation are those of the author(s) and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency.
Quality Reporting Process Improvement Initiative
Background

• EPA Quality Policy requires annual assessment and reporting of Quality System Status

• Traditionally accomplished via QA Annual Reports and Work Plans (QAARWPs)
  – Prepared by NPOs and Regions; and reported to EPA Office of Environmental Information (OEI) Enterprise Quality Management Division (EQMD)
  – Process widely viewed as “cumbersome, confusing, very time-consuming, and the least useful aspect of the Agency’s Quality System”
7/15: EQMD conducted a LEAN Kaizen event with Quality Community representatives from across the Agency

- Goal: Streamline process and reduce burden
- Recommended Solution
  - Establish an enterprise reporting system to support real-time data collection and reporting across EPA
  - Develop standardized reporting metrics
- Projected Outcome: Could decrease processing time by 19%, wait time by 74%, and process steps by 91%
• Late 2015
  – Quality Reporting Process Improvement (QRPI) Implementation Team established
  – Sub-teams convened to
    o Address specific aspects of the LEAN recommendations
    o Develop interim (bridge) reporting format for use while new systems were being developed
    o Communicate progress and results
Metrics Team Representation

Reflected the diversity of EPA organizations and experts implementing EPA’s Quality System.

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Office/Region</th>
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<tbody>
<tr>
<td>Marion Kelly</td>
<td>Co-Chair, Office of Water</td>
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<tr>
<td>Vincia Holloman</td>
<td>Co-Chair, Office of Environmental Information</td>
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<tr>
<td>David Charters</td>
<td>Office of Land and Emergency Management</td>
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<tr>
<td>John Warren</td>
<td>Office of Environmental Information</td>
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<tr>
<td>Paul Groff</td>
<td>Office of Research and Development</td>
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<tr>
<td>Linda Himmelbauer</td>
<td>LEAN Project Co-Lead, Region 8</td>
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<tr>
<td>Lora Johnson</td>
<td>Office of Research and Development</td>
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<tr>
<td>Barbara Leczynski</td>
<td>Office of Chemical Safety and Pollution Prevention</td>
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<tr>
<td>Juan Parra</td>
<td>Office of Environmental Information</td>
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<tr>
<td>Terry Simpson</td>
<td>Region 3</td>
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<tr>
<td>Robert Tallent</td>
<td>Office of Environmental Information</td>
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Metrics Challenges

• Success depends on
  – Enterprise System availability and capability
  – Management commitment to/resources for real-time data capture and reporting
  – Consistent interpretation of measured items
    ▪ e.g., what is a “project?”

• Lack of a consistent, compliance baseline across EPA

• Varied EPA perspectives regarding needs
  – Different missions and challenges / different needs for measuring effectiveness and efficiency

• Schedule
  – 10/1/2016 implementation mandate
Goals for Developing Metrics

• Short term: identify metrics that
  – Measure *compliance* with EPA Quality System requirements
  – Can be calculated from data captured in real time
  – Will provide a consistent and quantifiable baseline for measuring improvement across the Agency

• Long term: identify
  – Compliance metric updates after baseline is established
  – Metrics to characterize *efficiency* and *effectiveness*
Anticipated Benefits

• Support continuous improvement
  – Help identify strengths, weaknesses, and priorities
• Eliminate subjectivity and simplify annual reporting
  – Enable OEI to extract annual status information
• Reduce need for data calls
  – Query enterprise system to identify projects that relied on a specific organization or focused on a particular pollutant, indicator or treatment technology
• System + Metrics = Landmark achievement
  – Eliminate ~80 different systems and approaches
  – Reflect increased level of quality system maturity
Approach to Developing Metrics

• Weekly conference calls and an in-person meeting
• Considered
  – EPA Quality Policy (CIO 2105) requirements
  – > 100 metrics suggested in the FY 2015 QA Bridge reports
  – Lou Blume’s “Stages of Quality” paradigm
• Applied logic model to select 10 draft compliance metrics
  – Sought feedback from EPA Quality Community
    ▪ Via online survey
    ▪ During 6/2016 Chicago meeting
  – Refine metrics based on feedback
The 10 Proposed Metrics

1. No. of Approved QMPs ÷ No. of Organizations that need QMPs
2. No. of EPA QAMs to the nearest 0.1 FTE
3. No. of EPA approved QAPPs
4. No. of EPA-approved QAPPs ÷ No. of Required QAPPs
5. No. of EPA-approved QAPPs ÷ No. of Extramural Agreement
6. Percent of approved QAPPs that required one review, two reviews, etc.
7. No. of QSAs
8. No. of QSAs ÷ No. of EPA approved QMPs
9. No. corrective actions implemented to correct non-conformances ÷ No. of non-conformances found during assessments and audits
10. Percent of personnel that completed required QA Training
Stages of Quality
Stages of Quality System Implementation

- Quality programs are not implemented with the stroke of a pen upon the approval of a Quality Management Plan (QMP)

- Functional quality programs do not just happen – they evolve, typically after QMP approval
Value of Defining Stages of Implementation

• Provides a metric to measure success
• Emphasizes the fact that good programs take time and continuously improve
• Illustrates a quality continuum
• Establishes realistic expectations
Stages of Quality

1 – 5 years

Denial → Acceptance

Reluctance → Compliance

Bargaining Depression → True Value Added Cost Savings

Training → Nirvana*

Baby Steps

* Ideal condition of perfect harmony and peace
## Stage 1: 0-25%

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Actions</th>
<th>Attitudes</th>
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| • External pressure forces development of quality system  
• One person appointed to QA  
• No formal infrastructure for training, review, assessment and inventory  | • Appoint additional QA personnel, through management edict, try to harness enthusiastic people showing initiative  
• Artful Dodgers (Hide from Quality Manager)  
• Argue that project is not technical or no data, no sampling  | • Management views quality as outside their primary focus  
• Minimal understanding throughout organization, seen as an insurance policy  
• Staff have narrow view of when quality is needed |

<table>
<thead>
<tr>
<th>Keys to Success</th>
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| • Develop generic QMP (not too prescriptive)  
• Encourage broader ownership across the office  
• Try to document existing processes that relate to Quality (e.g., workload planning, expenditures)  
• Avoid using top down logic for selling Quality versus explanation of the benefits |                                                                         |                                                                         |
Stage 1 Questions

Focus on Awareness

• How do quality system components relate to our day-to-day activities?
• Who will lead our quality program and what do they need to be successful?
## Stage 2: 25-50%

<table>
<thead>
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<td>• QMP approved</td>
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<td>• Polarization of Quality Manager and Project Officers (Pos)</td>
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<td>• Develop inventory of projects/expenditures</td>
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<td>• Emphasize value of QA</td>
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<td>• Problem: “How will my QM fix this?”</td>
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<td>• Management takes ownership</td>
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<tr>
<td>• Develop inventory, capture quality during award phase, build rapport with grants, contract staff</td>
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<tr>
<td>• Build on positive behavior &amp; ignore nay-sayers</td>
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Stage 2 Questions

Focus on Inventory

• How many active projects do we support?
• What percent collect environmental information?
• How many of these projects have approved quality documentation?
Stage 3: 50-75%

| Characteristics                      | • QMP approved and partially implemented  
|                                    | • Quality Managers involved in management meetings  
|                                    | • Management begins to ask QA questions  |

| Actions                              | • Project Officers employ systematic planning for all projects  
|                                    | • QA staff involved in project planning  
|                                    | • Inventory of projects 100% implemented  |

| Attitudes                            | • Most staff believe QA provides value  
|                                    | • QM feels like part of the team and not tattle-tale  
|                                    | • Problem: “How will we fix this?”  
|                                    | • Management becomes enlightened by Quality status (answers to questions)  |

| Keys to Success                      | • QA staff must stay involved at project-level  
|                                    | • Recognize and reward QA successes  
|                                    | • Orient limited QA money to high priorities  |
Stage 3 Questions

Focus on Implementation

• How many projects have been assessed to evaluate key quality concerns and quality implementation?
• Are we focusing quality resources on the most important office decisions?
• Are we prioritizing resources to areas of greatest uncertainty?
• Is this uncertainty relevant to the decision to be made?
### Stage 4: 75-100%

| Characteristics | • Quality system is comprehensive  
|                 | • QA is a component of daily activities for all staff  
|                 | • Peer review & info quality key parts of quality system  
|                 | • Managers are actively involved and well-trained  
|                 | • Office is perceived positively by external clients |
| Actions         | • Use QA training & experience in hiring criteria  
|                 | • Staff use “we” terms instead of “you” terms  
|                 | • Continually re-evaluate, QM provides data assessments that relate to office-wide goals |
| Attitudes       | • Staff seek out QA personnel for assistance  
|                 | • Staff are empowered to improve quality  
|                 | • Staff reveal QA concerns - know they’ll be heard |
| Keys to Success | • Quality Manager integral part of project development  
|                 | • Project Officer seen as enforcer and not Quality Manager  
|                 | • Hire people with positive QA attitudes  
|                 | • Quality system relates to organizational goals |
Focus on Reflection

• Have true environmental outcomes been addressed?
• Have we discussed how these quality issues affect the decision?
• Is the final product disseminated, consistent with Information Quality Guidelines and Peer Review (reproducible)?
• Have we discussed recommendations for improvement?
What Holds Managers Back?

- Fear of additional resource demands
- Narrow view of quality (e.g., focus on lab data); not seen as their function
- They do not have battle scars from poor quality
- Not realizing the management tools associated with the quality process
Where is your quality system?

WWTTTW?

WWTTTW = What would the taxpayers want?
Metrics Workgroup: Products and Next Steps
Metrics: Where are we now?

• Identified 10 draft metrics
  – Intended to provide reliable information for senior managers about EPA Quality System health & performance
  – Not intended to compare QA activities and accomplishments among organizations

• Limitations
  – Focused only on compliance
  – Ignores efficiency and effectiveness, which tend to reflect higher stages of maturity
Next Steps

• Using Quality Community feedback to
  – Clarify scope and meaning of each metric
  – Eliminate or defer those deemed to be of little value

• Create new workgroup for implementation of adopted metrics
  – Evaluate and refine as needed

• Explore ideas for measuring efficiency and effectiveness
## Stages of Quality: Compliance, Efficiency, & Effectiveness

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<td>Most see QA as bureaucratic exercise &lt;br&gt; Difficult exchanges between QA staff &amp; POs &lt;br&gt; Problem: How will my QM fix this?</td>
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Yellow = Compliance  | Blue = Effectiveness  | Green = Efficiency
Observations

• As you move through the stages of maturity
  – Focus shifts from compliance to effectiveness and efficiency

• Stage 4 links Quality System to Organizational Goals
  – “Continually re-evaluate, QM provides data assessments that relate to office-wide goals” (action)
  – “Quality System relates to organizational goals” (key to success)
Observations

- More than half of the assessment factors in the stages are based on attitudes or behaviors, e.g.,
  - Artful dodgers vs. staff seeking out QA personnel for assistance
  - Polarization of QMs and Project Leads vs. QM feeling like part of the team
  - Staff use “you” instead of “we” terminology vs. staff feel empowered to improve quality
  - QA seen as a bureaucratic exercise vs. value of QA is emphasized
Questions

• If quality system success is largely based on attitudes and behaviors that impact efficiency and effectiveness
  – How do we *objectively measure* and quantify it?
  – Surveys? QSAs? Other ideas?

• Are there other ways to measure effectiveness and efficiency?
  – No. of products vs. no. challenges lost due to data quality (e.g., legal or IQG) Other ideas?

• How do we quantitatively tie how well a quality system relates to organization’s goals?
  – GPRA? Strategic Plan? Data Quality Records?

• What role would the enterprise QM system have?
Open Discussion
Let’s hear your thoughts!
Quality for Peak Performance!

Please send comments and questions to:

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Louis Blume, GLNPO Quality Manager  
312-353-2317  |  Blume.Louis@epa.gov

Acknowledgements
Special thanks to Molly Amos and Lynn Walters (CSRA) for assistance in developing this material
### GLNPO: FYs 2012 – 2016 active project status

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<th># Projects</th>
<th># Projects Requiring QD</th>
<th># Awaiting QD</th>
<th># Undergoing Review</th>
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<td>19</td>
<td>7</td>
<td>3</td>
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QD = quality documentation