

# Developing Metrics to Facilitate Quality System Maturity and Accountability

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# Agenda

| Topic                           | Presenter    | Time Frame (minutes) |
|---------------------------------|--------------|----------------------|
| Welcome and introductions       | Marion       | 5                    |
| QRPI Initiative Background      | Marion       | 10                   |
| “Stages of Quality” paradigm    | Lou          | 15                   |
| Proposed Metrics and Next Steps | Marion & Lou | 10                   |
| Open forum for discussion       | Everyone!    | 20                   |

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”

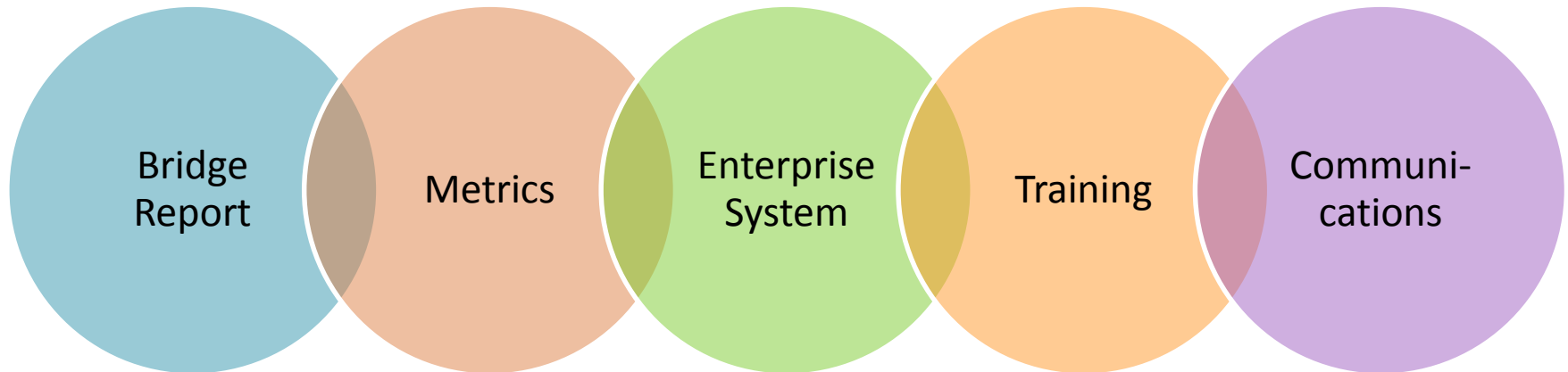
# Background (continued)

- 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%



# Background (continued)

- Late 2015
  - Quality Reporting Process Improvement (QRPI) Implementation Team established
  - Sub-teams convened to
    - Address specific aspects of the LEAN recommendations
    - Develop interim (bridge) reporting format for use while new systems were being developed
    - Communicate progress and results





# Metrics Team Representation

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

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



# 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)

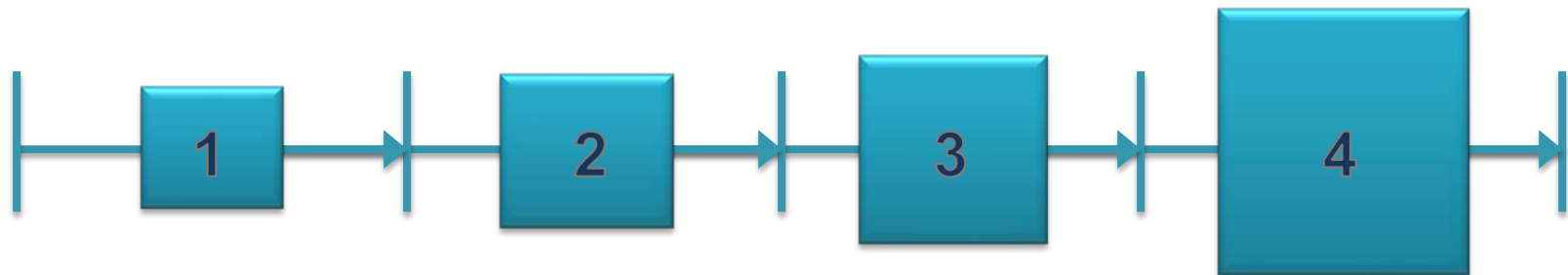


- Functional quality programs do not just happen – they evolve, typically after QMP approval

# Value of Defining Stages of Implementation

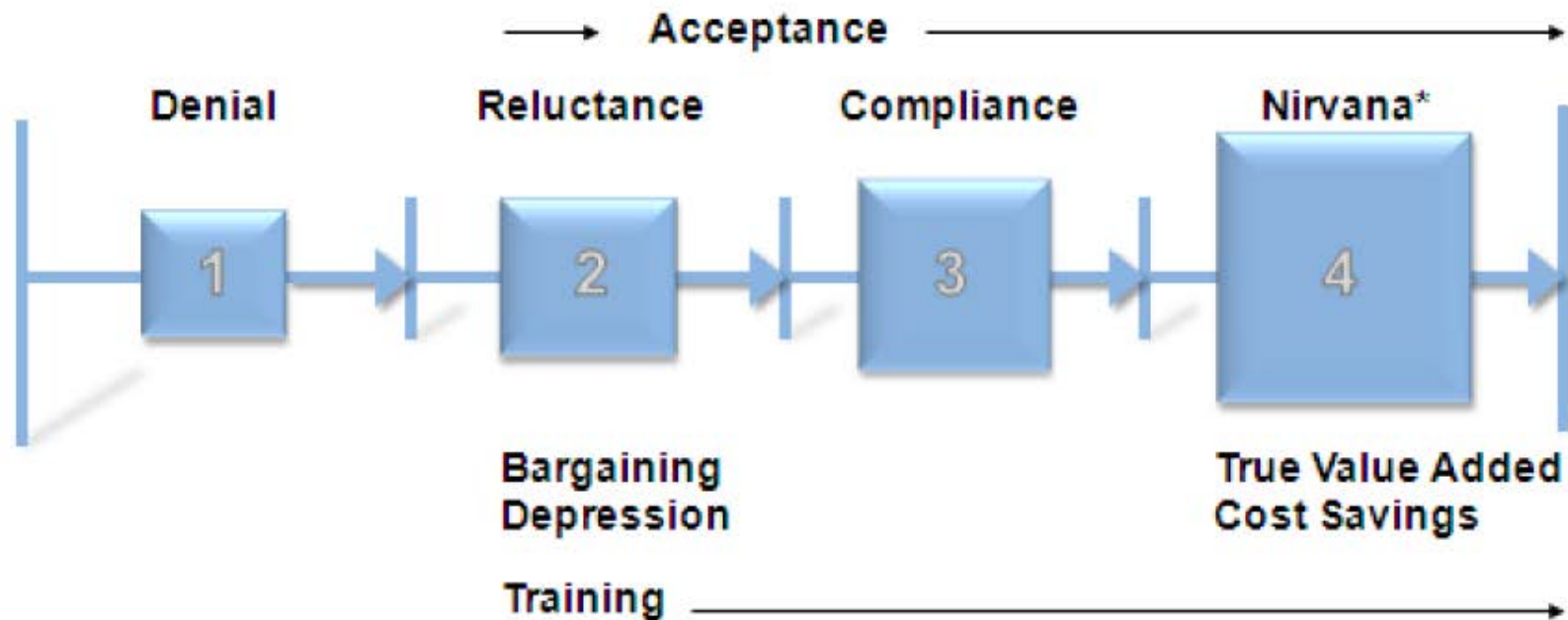
- Provides a metric to measure success
- Emphasizes the fact that good programs take time and continuously improve
- Illustrates a quality continuum
- Establishes realistic expectations

## Quality Infrastructure



# Stages of Quality

1 – 5 years



Baby Steps

\* Ideal condition of perfect harmony and peace





# Stage 1: 0-25%

|                        |  |
|------------------------|--|
| <b>Characteristics</b> | <ul style="list-style-type: none"><li>• External pressure forces development of quality system</li><li>• One person appointed to QA</li><li>• No formal infrastructure for training, review, assessment and inventory</li></ul>  |
| <b>Actions</b>         | <ul style="list-style-type: none"><li>• Appoint additional QA personnel, through management edict, try to harness enthusiastic people showing initiative</li><li>• Artful Dodgers (Hide from Quality Manager)</li><li>• Argue that project is not technical or no data, no sampling</li></ul>  |
| <b>Attitudes</b>       | <ul style="list-style-type: none"><li>• Management views quality as outside their primary focus</li><li>• Minimal understanding throughout organization, seen as an insurance policy</li><li>• Staff have narrow view of when quality is needed</li></ul>  |
| <b>Keys to Success</b> | <ul style="list-style-type: none"><li>• Develop generic QMP (not too prescriptive)</li><li>• Encourage broader ownership across the office</li><li>• Try to document existing processes that relate to Quality (e.g., workload planning, expenditures)</li><li>• Avoid using top down logic for selling Quality versus explanation of the benefits</li></ul> |



# 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%

|                        |  |
|------------------------|--|
| <b>Characteristics</b> | <ul style="list-style-type: none"><li>• QMP approved</li><li>• QAPPs developed for some projects</li><li>• Polarization of Quality Manager and Project Officers (Pos)</li></ul>  |
| <b>Actions</b>         | <ul style="list-style-type: none"><li>• QA staff identify delinquencies &amp; try to fill gaps</li><li>• Training initiated, typically introductory</li><li>• Good opportunity for external management system reviews</li><li>• Develop inventory of projects/expenditures</li><li>• Emphasize value of QA</li></ul> |
| <b>Attitudes</b>       | <ul style="list-style-type: none"><li>• Most see QA as bureaucratic exercise</li><li>• Difficult exchanges between QA staff &amp; POs</li><li>• Problem: “How will my QM fix this?”</li></ul>  |
| <b>Keys to Success</b> | <ul style="list-style-type: none"><li>• Management takes ownership</li><li>• Develop inventory, capture quality during award phase, build rapport with grants, contract staff</li><li>• Build on positive behavior &amp; ignore nay-sayers</li></ul>   |



# 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%

|                        |  |
|------------------------|--|
| <b>Characteristics</b> | <ul style="list-style-type: none"><li>• QMP approved and partially implemented</li><li>• Quality Managers involved in management meetings</li><li>• Management begins to ask QA questions</li></ul>  |
| <b>Actions</b>         | <ul style="list-style-type: none"><li>• Project Officers employ systematic planning for all projects</li><li>• QA staff involved in project planning</li><li>• Inventory of projects 100% implemented</li></ul>  |
| <b>Attitudes</b>       | <ul style="list-style-type: none"><li>• Most staff believe QA provides value</li><li>• QM feels like part of the team and not tattle-tale</li><li>• Problem: “How will we fix this?”</li><li>• Management becomes enlightened by Quality status (answers to questions)</li></ul> |
| <b>Keys to Success</b> | <ul style="list-style-type: none"><li>• QA staff must stay involved at project-level</li><li>• Recognize and reward QA successes</li><li>• Orient limited QA money to high priorities</li></ul>  |

# 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%

|                        |   |
|------------------------|---|
| <b>Characteristics</b> | <ul style="list-style-type: none"><li>• Quality system is comprehensive</li><li>• QA is a component of daily activities for all staff</li><li>• Peer review &amp; info quality key parts of quality system</li><li>• Managers are actively involved and well-trained</li><li>• Office is perceived positively by external clients</li></ul> |
| <b>Actions</b>         | <ul style="list-style-type: none"><li>• Use QA training &amp; experience in hiring criteria</li><li>• Staff use “we” terms instead of “you” terms</li><li>• Continually re-evaluate, QM provides data assessments that relate to office-wide goals</li></ul>  |
| <b>Attitudes</b>       | <ul style="list-style-type: none"><li>• Staff seek out QA personnel for assistance</li><li>• Staff are empowered to improve quality</li><li>• Staff reveal QA concerns - know they’ll be heard</li></ul>  |
| <b>Keys to Success</b> | <ul style="list-style-type: none"><li>• Quality Manager integral part of project development</li><li>• Project Officer seen as enforcer and not Quality Manager</li><li>• Hire people with positive QA attitudes</li><li>• Quality system relates to organizational goals</li></ul>   |



# Stage 4 Questions

## 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?

## WWTTW?

WWTTW = 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

|                        | Stage 1: 0-25%  | Stage 2: 25-50%  | Stage 3: 50-75%   | Stage 4: 75-100%  |
|------------------------|---|--|---|---|
| <b>Characteristics</b> | <ul style="list-style-type: none"> <li>External pressure forces development of QS</li> <li>One person appointed to QA</li> <li>No formal infrastructure for training, review, assessment and inventory</li> </ul>   | <ul style="list-style-type: none"> <li>QMP approved</li> <li>QAPPs developed for some projects</li> <li>Polarization of QM and POs</li> </ul>  | <ul style="list-style-type: none"> <li>QMP approved and partially implemented</li> <li>QMs involved in management meetings</li> <li>Management begins to ask QA questions</li> </ul>  | <ul style="list-style-type: none"> <li>Quality system is comprehensive</li> <li>QA is a component of daily activities for all staff</li> <li>Peer review &amp; info quality key parts of QS</li> <li>Managers are actively involved and well-trained</li> <li>Office is perceived positively by external clients</li> </ul> |
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Yellow = Compliance | Blue = Effectiveness | Green = Efficiency



# Observations

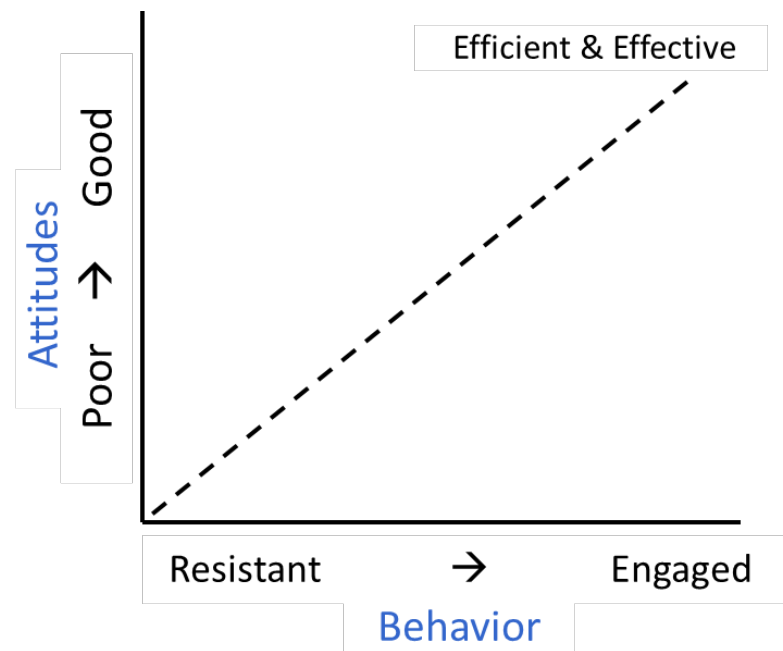
- As you move through the stages of maturity
  - Focus shifts from compliance to effectiveness and efficiency
- Stage 4 links Quality System to Organizational Goals
  - “Continually re-evaluate, QM provides data assessments that relate to office-wide goals” (*action*)
  - “Quality System relates to organizational goals” (*key to success*)



# Observations



- More than half of the assessment factors in the stages are based on an 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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## Acknowledgements

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for assistance in developing this material

# GLNPO: FYs 2012 – 2016 active project status

| Issued | # Projects | # Projects Requiring QD | # Awaiting QD | # Undergoing Review | # Conditionally Approved | # Fully Approved | % Fully Approved |
|--------|------------|-------------------------|---------------|---------------------|--------------------------|------------------|------------------|
| FY2012 | 62         | 40                      | 0             | 1                   | 2                        | 38               | 93%              |
| FY2013 | 60         | 41                      | 2             | 2                   | 1                        | 36               | 88%              |
| FY2014 | 36         | 31                      | 0             | 1                   | 2                        | 28               | 90%              |
| FY2015 | 48         | 34                      | 0             | 4                   | 1                        | 29               | 85%              |
| FY2016 | 51         | 43                      | 19            | 7                   | 3                        | 14               | 33%              |

QD = quality documentation