NBIP: National Bridge Inspection Program

Aligning Scour into Data Driven, Risk Based Approaches

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presentation to
SEBPP
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Purpose & Objectives

• Describe New NBIP oversight process

• Discuss application to scour metric

• Address your questions
New NBIP Process

Why?

• FHWA saw need

• Bridge failure high-risk

• States’ concern about FHWA consistency

• I-35 W and OIG audits

• Congress said to improve our oversight
New NBIP Process

Pre-2011 Oversight Approach

- Recommended scope of annual reviews
  - Review of files, procedures and documentation
  - Site visits
  - NBI data checks
  - Interviews
- High degree of variability
- Annual summary reports
New NBIP Process

What’s Different?

• Consistency across the Nation
• Use of statistical samples
• Application of risk considerations
• Compliance status monitored quarterly
• Final compliance report on December 31st
New NBIP Process

Specific Aspects

• 23 Individual **Metrics**
  – Relate to specific requirements of the NBIS

• **3 Assessment Levels**
  – Defines specific review criteria and data sources

• **4 Levels of Compliance**
  – Defines specific compliance thresholds

• **Risk Consideration**
  – Structurally deficient, fracture critical, scour critical bridges = higher risk and lower tolerance

• **Clearer Reporting & Oversight**
  – Less burdensome
New NBIP Process

Specific Aspects: **Metrics**

• **Generic Definition**

  Quantified NBIS requirement by which one can make an assessment of compliance

• **Specific Metric (#18)**

  650.313 (e) (3) - Bridges that are scour critical
  Has a plan of action (POA) been prepared to monitor known and potential deficiencies and to address critical findings? Have bridges that are scour critical been monitored in accordance with the plan?
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**Specific Aspects: Metrics**

- Organization
- Program Manager qualifications
- Team leader qualifications
- Load Rater qualifications
- Underwater diver qualifications
- Routine inspection frequency
- Extended inspection frequency
- Underwater frequency
- Extended underwater frequency
- Fracture critical frequency
- Damage, in-depth, special frequency
- Inspection procedures
- Load rating procedures
- Posting procedures
- Bridge files
- Fracture critical procedures
- Underwater procedures
- Scour critical POAs
- Complex bridge procedures
- QC/QA procedures
- Critical findings procedures
- Inventory upkeep
- Timeliness of data updates
New NBIP Process

Specific Aspects: *Assessment Levels*

- **Minimum**
  - General knowledge and awareness of the state’s program in relation to the metric
  - Analysis of NBI data

- **In-depth**
  - Larger sample sizes
  - More interviews
  - Research of records and/or history

- **Intermediate**
  - Sampling of inspection records or files
  - Analysis of NBI data
  - Visits to bridges
  - Interviews
  - Documentation of qualifications
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Specific Aspects: **Compliance Levels**

- **Compliance**
  - Adhering to NBIS regulation.

- **Substantial Compliance**
  - Adhering to NBIS regulation with minor deficiencies. Deficiencies to be corrected within 12 months or less, unless deficiencies are related to issues that would most efficiently be corrected during next inspection.

- **Non-Compliance**
  - Not adhering to NBIS regulation. Identified deficiencies may adversely affect the program. Failure to adhere to an approved plan of corrective action is also considered non-compliance.

- **Conditional Compliance**
  - Taking corrective action in conformance with FHWA approved plan of corrective action (PCA) to achieve compliance with NBIS.
New NBIP Process

Specific Aspects: *Non-Compliance*

- **Plan of Corrective Actions (PCA)**
  - Documented agreement with State
    - Process and schedule to correct deficiencies
    - Periodic reporting to monitor status
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Specific Aspects: *Risk-Based*

- What Do We Mean By Risk?

**Strategy of Prioritizing the Vulnerable Bridges** using concepts of **Bridge Importance**, **Consequences of Failure**, & **Suitability of Approach** to develop an acceptable plan of action or plan of corrective action
**New NBIP Process**

**Specific Aspects: Risk-Based PCA/POA**

- **Vulnerability**: Bridge metrics of sufficient importance so that compliance is imperative

- **Prioritization**: Measure of the ranking of or sequence for taking an action at bridges
  - **Bridge Importance**: Focus on bridges of more significance relative to other bridges
  - **Consequence of Failure**: Measure of how loss of a bridge impacts public safety, disrupts transportation, & incurs economic costs for correction or replacement
  - **Suitability of Approach**: Relative appropriateness of a type of remedial approach (e.g., scour countermeasure) given Bridge Importance & Consequence of Failure
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Specific Aspects: *Risk & Vulnerability*

**Metric 18: Scour at Bridges**

- **SCOUR CRITICAL**
  - Compliance (C): Yes.
  - Substantial Compliance (SC): NA.
  - Non-Compliance (NC): Less than 100%.
  - Conditional Compliance (CC): Adhering to approved plan of corrective action.
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Specific Aspects: *Risk & Prioritization*

**Metric 18: Scour at Bridges**

- **How to Prioritize?**
  - Make Data Driven

- **What Data?**
  - NBI Data
    - Functional Classification
    - Average Daily Traffic
    - Detour Length
    - Deck Length/Area
    - Other (Owner)

![Pie chart showing Oklahoma - Scour Critical Using Deck Area (ft²)]
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Specific Aspects: Risk & Importance

Metric 18: Scour at Bridges

• Bridge Importance

2009 NBI Data:
IHS: 991
NHS: 1935
NNHS: 18162
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Specific Aspects: *Risk & Consequences*

**Metric 18: Scour at Bridges**

- **Consequence of Failure**
  - Low
    - Low ADT
    - Non-NHS Bridge
  - Medium
    - State Bridge
  - High
    - Interstate
    - School Bus Route
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Specific Aspects: Risk & Suitability

Metric 18: Scour at Bridges

• Suitability of Approach
  1. Interstate
     • Consequence = High<sub>c</sub>
     • Life = Long
     CM Type: Structural or Hydraulic
  2. Low ADT Bridge
     • Consequence = Low<sub>c</sub>
     • Life = Immaterial
     CM Type: Monitoring
  3. NHS Bridge, Long Detour
     • Consequence = Mid<sub>c</sub> to High<sub>c</sub>
       a. Life = Long
          CM Type: Structural or Hydraulic
       b. Life = Short
          CM Type: Monitoring
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Specific Aspects: **Reporting**

Assessment Reporting Tool (ART)
New NBIP Process

Important Takeaways

• New process to be used in 2011
• Former annual NBIS summary report discontinued after 2010
• Compliance of 23 metrics rather than single overall determination
• NBIS regulation DID NOT CHANGE!!
• Implementation assistance available from Bridge Safety Engineers
• Level of effort may be higher than the past
Questions