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National Bridge Inspection Program

HIBS-30

NBIPOT

Compliance Review Manual

April 1, 2018

(Includes May 31, 2017 Metrics)

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Introduction

This document provides guidance and direction to the FHWA Division Bridge Engineers in performing National Bridge Inspection Program (NBIP) compliance reviews of State bridge safety inspection programs. The term “reviewer” refers to the FHWA Division Bridge Engineer. The term “State” refers to either a State DOT or Federal agency being reviewed. The document is not intended to provide guidance and direction to the States.

This document explains the NBIP review process including concepts utilized in multiple NBIP metrics. It explains in more detail the items contained in the National Bridge Inspection Standards Review Notice - May 5, 2014. The Notice outlines the overall NBIP process including a listing of the individual metrics utilized in the process, and this document further explains the NBIP process while also providing information applicable to multiple metrics.

The Bridge Program Manual (BPM) Chapter 2 should be referenced for further details on how to address identified compliance issues, such as the requirements of Plans of Corrective Actions, Improvement Plans, and other Non-Compliance issues.

Definitions

The terms presented herein are used throughout this document in both the guidance and metric language portions. See also page 44 for acronyms and additional terms.

Acceptable Tolerance – Allowable variance for an NBI item as identified in the NBIP Field Review Form.

Bridge Inspection Procedures, Bridge Specific – Documented procedures specific to a bridge which include the location of the element to be inspected and any risk factors unique to the bridge, and any variance or additional requirements to those identified in general procedures.

Bridge Inspection Procedures, General – Overall inspection procedures, typically documented in the owner's bridge inspection manual, for specific inspection types. The procedures include the inspection frequency, access methods, experience/training requirements, additional NDT inspection requirements, and general risk factors.

Bridge Safety Engineer (BSE) – FHWA HQ engineer assigned to a specific area to deliver and assist with implementing the NBIP in each Division of that area.

Census – A complete accounting of a population.

Commentary – Additional information for each metric, providing the reviewer insight and background into applicable sections of the metric regarding "how" or "why," often including some likely scenarios or examples.

Compliance (C) - The act of adhering to the NBIS regulation.

Computations – When evaluating the contents of a bridge inspection file, these include but are not limited to load rating and scour evaluation calculations.

Conditional Compliance (CC) – The act of taking corrective action in conformance with an FHWA approved (PCA) to achieve compliance with the NBIS. Deficiencies, if not corrected, may adversely affect the overall effectiveness of the program.

Criteria – Regulatory aspects of the specific metric that is the standard by which compliance is measured.

Critical Findings, Active – Those in which the owner has not taken action to address public safety, such as closure, lane or load restriction, shoring, repair, or replacement of the bridge.

Critical Finding, Addressed – Those that the owner has taken action to address public safety, such as closure, lane or load restriction, shoring, repair, or replacement of the bridge. Increased inspection frequency alone may not fully address a critical finding if the safety issue is not rectified.

Critical Finding Notification – The process used by the State to notify FHWA of new and active critical findings. The maximum suggested interval for FHWA notification is three months.

Data-Driven – Using best available data and encompassing areas defined by law and regulation, including materials incorporated by reference, policies, and guidance.

Delegated Functions – Functions of the NBIS that the State delegates to bridge owners. Delegation to other agencies must be clearly defined and documented; each State office, District office, owner, or other entity must be given clear direction for assigned or delegated roles or tasks.

Delinquent Inspection – A recent bridge inspection that was completed but was beyond the allowable inspection interval.

Designated Program Manager (PM) – The individual in charge of the bridge inspection program. The assignment of an individual to the position may be acting or permanent.

Documented Scour Evaluation - A report with calculations, a documented assessment, or documented screening process explaining how the Item 113 value was determined. This evaluation should be available for every bridge over water.

Extended Interval Inspection - With prior written FHWA approval, certain bridges may have a routine inspection performed at a regular interval greater than 24 months, not to exceed 48 months, or an underwater inspection at greater than 60 month intervals, not to exceed 72 months.

Final Summary of Metric (FSM) – Documented annual summary of the assessment of a metric and resulting conclusions; includes extent of review, assessment level, observations, findings, compliance determination, and PCA progress; an element of SMART application on SharePoint.

Geographic Partitioning – Dividing a State into smaller areas for NBIP field reviews that covers the entire State at least once over the 5-year cycle, is drawn from a unique population each year, includes all owning agencies, and is documented in the Final Summary of Metric.

Higher Risk bridges – Those bridges with: NBI condition ratings of 4 (Poor) or less for Superstructure (Item 59), Substructure (Item 60), or Culvert (Item 62); Item 70 $\leq$ 4 (posting required); NBI appraisal rating of 3 or less for Item 67 (Structural Evaluation); bridges requiring load restriction (NBI Item 41 coded B, P or R); bridges with temporary supports (NBI Item 41 coded D); or bridges with fracture critical members (FCMs).

Improvement Plan (IP) – Documented agreement submitted by the State DOT and approved by the FHWA Division, containing specific actions and timelines to address deficiencies identified in a substantial compliance determination to achieve compliance. The timeframe for such agreements is typically limited to 12 months or less, unless the deficiencies are related to issues that would most efficiently be corrected during the next inspection. An IP does not require coordination between FHWA HQ and the BSE.

In-Depth Assessment Level (InD-AL) – Higher level review than Int-AL, HQ directed, or customized; the InD-AL is performed for either specific national direction when necessary, or for a customized approach where the reviewer defines criteria with concurrence from the BSE, providing more flexibility to Divisions in responding to various compliance issues that arise. The InD-AL is a deeper review and not just a broader review.

Inspected in accordance with the AASHTO MBE – Inspection processes and techniques are generally consistent with MBE Section 4 for Routine, FCM, and UW inspections.

Intermediate Assessment Level (Int-AL) – A review which includes interviews, sampling, MAR/more data analysis, file reviews for a random sample of bridges, as applicable to adequately assess performance.

Level of Confidence (LOC) – A measure of the reproducibility of a random sample.

Load Rating – The live load carrying capacity of a bridge determined using bridge plans and supplemented by information gathered from a field inspection.

Load Rating Determination – Exists when the bridge has a load rating method and value recorded in the NBI.

Load Rating Documentation - Provides a basis for the reported rating values; such as: calculations and computer input/output, or justification for assigned ratings and engineering judgment ratings.

Lower risk bridges - Those bridges that are not classified as higher risk bridges.

Margin of Error (MOE) – The likelihood that the result of a sample is close to the result obtained had the entire population been studied. Tolerance level for error in the randomly selected sample. Expressed as a percentage.

Metric - Quantified NBIS information by which one can make an assessment of compliance.

Metric Assessment Report (MAR) – Data analysis tool used for specific metrics where data is available for such analysis; generated using NBI Data.

Minimum Assessment Level (Min-AL) – A review which is based upon reviewer's knowledge of the program, MAR review, PM interaction, and PCA/IP progress where applicable.

National Bridge Inventory (NBI) Data Checks – Data analyzed from the annual NBI submittal for inconsistencies and errors, with reports sent to the Division and State by the FHWA National Bridge and Tunnel Inventory Engineer in the Office of Bridges and Structures; these checks include: National Bridge Inventory File Check, Safety Related Checks, and Persistent Error Reports.

NBIP – National Bridge Inspection Program.

90/180 day Timeframe – The requirement to update the SI&A data into the State or Federal inventory upon completion of work. Must submit the SI&A data changes to the State within 90 days of the completion of the activity (inspection, load rating, etc.) for State owned bridges and 180 days for Local agency owned bridges.

Non-Compliance (NC) – The act of not adhering to the NBIS regulation. Identified deficiencies may adversely affect the overall effectiveness of the program. Failure to adhere to an approved plan of corrective action is also considered non-compliance.

Notable Bridge Deficiencies – Those deficiencies leading to NBI component ratings of 5 or less and requiring documentation in the inspection report.

Overall Responsibility for Load Rating – The Load Rating Engineer (LRE) has final responsibility for all load ratings; this does not mean that the LRE must complete or review all load ratings directly.

Overdue inspection – An inspection that was due prior to the NBI submission date, but a new inspection date was not submitted. Until resolved, an overdue inspection is considered a safety concern.

Plan of Corrective Action (PCA) – Documented agreement prepared and submitted by the State DOT and approved by the FHWA Division, containing specific actions and timelines to correct noncompliance issues related to an NBIS metric to achieve compliance; requires BSE coordination.

Population – The group of all items (people or bridges) pertinent to the metric under review. For metrics that utilize sampling, this is the pool from which the statistical sample is drawn. Inferences can then be made from the sample results about the population.

Promptly Resolved Load Posting - Proper posting of a bridge after notification of a load posting deficiency within the timeframe stipulated in the State load posting procedures. The FHWA recommends posting as soon as possible depending on urgency, up to 90 days, if no timeframe has been established.

Quality Assurance - The use of sampling and other measures to assure the adequacy of quality control procedures in order to verify or measure the quality level of the entire bridge inspection program.

Quality Control - Procedures that are intended to maintain the quality of a bridge inspection program activity at or above a specified level.

Quality Control / Quality Assurance (QC/QA) Plan Implemented - Infers that QC/QA procedures are enacted and used.

QC/QA Plan Key components - Includes periodic field review of inspection teams; periodic bridge inspection refresher training for program managers and team leaders; and independent review of inspection reports, NBI data, and computations.

Random Sample – A subset chosen from the population randomly, such that each individual has the same probability of being chosen, using random values applied to the population to determine which data are selected for review. Statements concerning findings are pertinent to the population from which the sample was drawn.

Reduced Interval Bridge Inspections - Bridge inspections based on State established criteria to determine the level and frequency at which the bridges are inspected considering factors such as age, traffic characteristics, and known deficiencies.

Risk-based - The likelihood a future event or action will happen, and the benefits or adverse impacts if the event or action occurs.

Safety Issues - Those issues related to bridge closure, posting, critical findings, and overdue inspections.

Sample – Subset of the population to be reviewed. In some situations, the sample may be the entire population.

Sample Size – The number of individuals chosen to represent the population, determined by the desired LOC and MOE.

Sampling Tool – The NBIP tool used annually by the reviewer to identify samples for specific metrics when samples are called for; generated using NBI Data for both file and field reviews. It is located on the NBIP SharePoint site under "Forms, Tools, and Examples"

SharePoint Metric Assessment Reporting Tool (SMART) – Current FHWA reporting tool and database for documenting State compliance with the NBIS; includes FSMs, attachments, 5-year cycle summary reports, etc.

Statistical Sampling - The selection of a subset of individuals from a population to estimate characteristics of the whole population.

Substantial Compliance (SC) - Adhering to the NBIS regulation with only minor deficiencies that do not adversely affect the overall effectiveness of the program and are isolated in nature.

Tier 1 - The sampling level typically used for the metrics assessment sample size, with an 80% LOC and 15% MOE.

Tier 2 - The sampling level typically used when additional sampling will reduce the margin of error through an increase in sample size while maintaining the same LOC.

Timely - Meeting the timeframe established in the State's procedure for addressing critical findings; also, meeting FHWA-expected timelines.

NBIP Compliance Review

I. Background and History

In response to the Office of Inspector General (OIG) recommendations and congressional direction, in 2010 the Federal Highway Administration (FHWA) developed a new systematic, data-driven, and risk-based oversight process for monitoring State compliance with the National Bridge Inspection Standards (NBIS). To initiate this effort, in 2008 a team of FHWA Bridge Engineers was gathered to determine how to define:

- levels of compliance,
- items from the NBIS to be measured,
- how those measurements would affect the levels of compliance, and
- what actions may need to be taken based on the levels of compliance.

This team determined that the NBIS can be measured by 23 metrics that can be independently assessed to determine compliance. Each of those 23 metrics can be traced directly to wording in the NBIS regulation at 23 CFR 650 subpart C.

In 2009, a second team of FHWA Bridge Engineers was gathered to examine the National Bridge Inspection Program (NBIP) oversight practices of each Division. They were tasked with incorporating the documents being developed by the first team into the NBIP oversight process. Additionally, the second team was tasked to determine a method to report the results of the annual review and to recommend how the NBIP oversight reports could address the second recommendation from OIG to develop a comprehensive plan to routinely conduct systematic, data-driven analysis to identify nationwide bridge safety risks for remediation in coordination with the States.

Based on these efforts, FHWA decided to move from an overall compliance determination for a State to an individual compliance determination for each area of the NBIS regulation being measured. Annually, each metric is assessed at one of three different intensity levels, based on risk and on the duration since the metric was last assessed a specific intensity level. Each year, FHWA analyzes results from the State reviews to identify nationwide risks that may require closer review in future years. As a result, the developed process is a comprehensive plan to annually conduct systematic, data-driven analyses to identify nationwide bridge safety risks for remediation in coordination with the States.

A database has also been developed for documenting the results of the annual reviews. This database contains the current status and history of each metric's review, an explanation of the how the review was performed, observations from the review, findings and recommendations for each metric, and attachments for supporting documentation and any action plans to resolve compliance deficiencies. There have been several iterations of the Assessment Reporting Tool (ART) database. The latest database is known as SharePoint Metric Assessment Reporting Tool (SMART).

In February 2010, FHWA's Office of Bridge Technology initiated a pilot program to determine the time, effort, and reasonableness of the process. The CA, WA, NV, AZ, UT, CO, OK, MO, FL, WV, RI, and AL Division Offices were involved in the pilot program. The pilot program was completed in late May 2010. In June 2010, all pilot Division Office personnel gathered to debrief on the time, effort, and reasonableness of the process. Adjustments to the process were made following the pilot in preparation for nationwide implementation beginning in February 2011.

The metrics assessment methodology established three assessment levels (Min-AL, Int-AL, and InD-AL) for each metric, with varying assessment requirements for each assessment level. The calendar year 2011 (CY 2011) review was used to establish a baseline with all metrics assessed at the Int-AL. Subsequently the review schedule was adjusted to align with the FHWA performance year. Therefore, the next review year, CY2012, was termed Performance Year 2013 (PY2013).

In 2012, following the completion of the first NBIP Metrics (baseline) Review, several changes were made in response to recommendations made by a FHWA/AASHTO National Bridge Inspection Task Force, which included FHWA Divisions and Headquarters, AASHTO, and State DOT staff. Overall the Task Force identified 10 short-term deliverables that were completed for the PY2013 NBIP Metrics Review. The most notable modifications from the Task Force review were a change to Metrics 6, 7, 8, 9, 12 and 22.

- Metrics 6 and 8 were previously assessed as routine and underwater inspections, respectively, at a 24 month or higher inspection frequency. The intent of Metric 6 and 8 was changed to assess routine and underwater inspections at either regular or extended frequency for structures classified as low risk. Low risk is defined for Metric 6 as NBI condition rating (NBI Item 59 and 60, or 62)>4 and either (NBI Item 70=5 and Item 63≠5) or (Item 63=5 and Item 70=5 and Item 41= A, D, or E) or (Item 113=4, 5, 7, or 8); and for Metric 8, same criteria as Metric 6 except NBI condition rating only applies to NBI Item 60 or 62 >4.
- Metrics 7 and 9 were previously assessed as routine and underwater inspections, respectively, at an extended inspection frequency. The intent of Metric 7 and 9 was changed to assess routine and underwater inspections at either regular or extended frequency for structures classified as high risk. High risk is defined for Metric 7 as NBI condition rating (NBI Item 59 or 60, or 62) <5 or NBI Item 70<5 or (NBI Item 63=5 and Item 70=5 and Item 41= B, P, or R) or (Item 113= 0, 1, 2, 3, 6, T or U); and for Metric 9, same criteria as Metric 7 except NBI condition rating only applies to NBI Item 60 or 62<5.
- Metric 12 and 22 were also revised to include the assessment for the quality of inspections and report documentation. A field review form was provided to guide the reviewer in completing their field reviews.

The performance year 2013 (PY2013) review is considered the first year of the established 5-year cycle of annual reviews. During the 5-year cycle, the reviewer will assess each metric annually at the Min-AL, and assess each metric at the Int-AL or InD-AL at least once within the 5-year cycle. After each 5-year cycle, the reviewer will evaluate 5-year review history to identify trends in each metric area, identify any gaps in the program or review process, and develop a review strategy for the next 5-year cycle.

For PY2014, commentary was provided for each of the metric summaries, reporting requirements in ART were established, and new Metric Assessment Reports (MAR) were developed or revised for Metrics 6, 7, 8, 9, 10, 13, 14, and 18. Since PY2014, the metrics review process has remained largely unchanged, until some minor revisions to the metric compliance criteria and commentary were made for PY2018. The MAR for Metric 11 was added in PY2016 to be used for information purposes only in evaluating the timeliness of increased frequency inspections.

See Section XI at the end of this document for further explanation of the changes made for PY2018. As a result of this new process, a National Bridge Inspection Program Oversight Team (NBIPOT) was established to maintain and monitor the oversight process; to ensure that areas of greatest risk are identified and addressed; and that agency oversight practices are carried out in a consistent, effective, and efficient manner.

The FHWA has implemented a data-driven, risk-based bridge inspection program oversight process agency-wide. Through this review process, each State is held to the same standard for compliance. Annual compliance reporting is consistent between the Divisions. States and FHWA can use the data to track national trends and assess needs and resources to improve deficiencies.

In order to provide ready access to guidance for the NBIP process, FHWA established the NBIP SharePoint site. The SharePoint site is a repository of useful information and should be referred to regularly when planning and performing the annual NBIP review.

II. FHWA Staff Roles

The annual Compliance Review is an important endeavor that involves several offices within the agency. The Office of Bridges and Structures group (HIBS) within the Office of Infrastructure (HIF) at Headquarters, Division Offices, and the Resource Center work together to complete the Compliance Review. Staff roles within these agencies are described in in further detail below.

Headquarters - HIBS

Within the Bridges and Structures group, personnel on the Structures Safety, Preservation, and Management Team (HIBS-30) primarily, but also the Structural Engineering Team (HIBS-10) and the Hydraulics & Geotechnical Engineering Team (HIBS-20) serve in the following capacities:

- Develop national policy and guidance.
- Provide specific technical direction or guidance.
- Maintain the NBI database.
- Brief FHWA leadership team on State of the program including
    - emerging issues
    - other items of importance/interest
- Address inquiries from FHWA leadership team.
- Coordinate activities of the National Bridge Inspection Program Oversight Team (NBIPOT).
- Represent FHWA on AASHTO Subcommittee on Bridges and Structures (SCOBS) Technical Committee on Bridge Management, Evaluation, and Rehabilitation (T-18).

Bridge Safety Engineers

The Bridge Safety Engineers (BSE) are on the Structures Safety, Preservation, and Management Team (HIBS-30) in the Office of Bridges and Structures. There are four (4) BSEs located throughout the country and organized by Director of Field Services (DFS) areas - West, Mid-America, North, and South. They coordinate activities with each other and with the National Bridge and Tunnel Inspection Engineer (NBTIE) to ensure national consistency. They serve in the following capacities:

- Develop and disseminate guidance to ensure that Divisions are performing the Compliance Review consistently across the country.
- Train new Division Bridge Engineers (DBE) on how to perform the Compliance Review.
- Host periodic regional and national NBIP webinars to update the DBE's on current criteria for performing their NBIP reviews.
- Write the annual National Summary Report regarding the results of the NBIP review.
- Periodically assist DBEs with portions of the review, for example by accompanying DBEs on some of the site (field) visits or reviewing records in the office.
- Respond to requests for assistance from Divisions.
- Review and approve PCAs.
- Maintain SMART and the NBIP SharePoint site.
- Serve as members of NBIPOT.

Division Bridge Engineers

One of the main duties of the DBE is to evaluate the compliance of the State DOT Inspection Programs with the NBIS. Other duties are discussed in other chapters of the Bridge Program Manual. The DBE has the responsibility for completing all the steps of the annual review for their State DOT as defined in the specific metric language. Notable steps typically include the following, depending on assessment level:

- Develop a random sample using the Sampling tool.

- Create and resolve Metric Assessment Reports (MARs).
- Review State DOT bridge inspection and ratings files, records and documents.
- Interview State bridge program personnel
    - State staff
    - Consultants - Depending on the role of consultants in a State program, they may need to be interviewed as well, such as Team Leaders or Underwater Inspectors. State DOT should coordinate and participate in the interview.
    - Local Agency Staff – As needed based on involvement in the program. State DOT should coordinate and participate in the interview.
- Review and error-check State NBI data and work with State to resolve discrepancies.
- Perform on-site reviews of bridges (field review).
- Make compliance determinations for each metric.
- Clearly explain and justify the compliance determinations by documenting the extent of review, observations, findings, and conclusions in the FSM in SMART.
- Communicate the Compliance review results in a timely manner to the State through reports and other correspondence necessary to allow the State to develop any needed Plans of Corrective Action (PCA)s or Improvement Plans (IP)s.
- Review State DOT IPs and PCAs.
    - Coordinate with BSEs for review and approval of PCAs.
- Monitor the progress of the metric PCAs and document in a Quarterly Progress Report.
- Plan for future compliance reviews in accordance with the 5-year cycle.
    - This may involve risk assessment or other strategic planning, re-assessed each year.

Resource Center – Structures Technical Services Team

As agency resources allow, Resource Center personnel serve as needed in the following capacities:

- Technical support for DBEs to aid in monitoring NBIS compliance and helping to improve the State inspection programs.
- Coordinate Bridge Inspection Peer Program Reviews and Bridge Inspection Peer Program Exchanges.
- Technical assistance to the BSEs and NBIPOT in development of tools (spreadsheets, reports, guidance documents, etc.) to ensure consistency in the Annual Compliance Review.
- Develop and provide training on bridge inspection related topics.
- Serve as members of NBIPOT.

National Bridge Inspection Program Oversight Team

The NBIPOT maintains and monitors the FHWA oversight of the NBIP; ensure oversight practices are being carried out in a consistent, effective, and efficient manner; and identify and mitigate top national risks. The team reports to the Structures Safety, Preservation, and Management Team Leader and makes recommendations for oversight improvements or adjustments. The NBIPOT is a working group that consists of the 4 BSEs, 2 DBE Representatives, a Resource Center representative, and the NBTIE. The NBTIE will serve as the team lead and is responsible for arranging team discussions and meetings, ensuring that the objectives are accomplished, and for documenting the activities of the team. The team activities include:

- Provide feedback to the Team Leader, and Director of HIBS, and Division Offices through an annual national progress report that highlights the outcome of the past year's oversight efforts, metric findings, and other key activities and events.
- Perform an annual quality assurance review of the Division Offices' Final Summary of Metrics.

- Complete a biennial assessment of national risk areas by reviewing data submitted by individual FHWA Division Offices and maintaining an awareness of issues that are of national concern. Share the results of this assessment with the Division Offices and the Director.
- Determine the need for and develop standard tools that support the oversight process.
- Respond to requests for specific types of assistance regarding NBIP issues of national concern.
- Define FHWA staff training needs to provide consistent, effective, and efficient oversight of the NBIP, and coordinate development and delivery of the training. Annual training shall be given for FHWA staff, including topics on the future year's focus areas, any procedural or format changes, data issues, consistency issues, national initiatives, and compliance issues.
- Suggest performance measures to leadership for unit plans.
- Provide an efficient mechanism for internal stakeholder input relating to the NBIP.

III. The Overall Metric Assessment Process

Purpose

The NBIP Compliance Review provides an annual assessment of State's compliance with the NBIS regulations. This is accomplished using a series of metrics that directly measure adherence to the requirements of the NBIS. This annual process allows FHWA to assess each State's bridge inspection program degree of compliance with the NBIS, and to implement any corrective actions for metrics which are not in full compliance in a nationally consistent manner.

National Bridge Inspection Standards Review Process Notice

The NBIP Compliance Review process was developed internally by FHWA and a Federal Register Notice was issued to solicit public comment. The guidance on the process was finalized, and the *National Bridge Inspection Standards Review Process* Notice was issued on May 12, 2014 (79 FR 27032). The Notice defines the metrics, annual review schedule and 5-year review cycle, findings of noncompliance, and penalty for noncompliance. Key points of the Notice as well as supplemental guidance are provided below.

Metrics

This Metrics Manual, drafted and maintained by the National Bridge Inspection Program Oversight Team (NBIPOT), will help Reviewers assess criteria for each metric to determine the degree of compliance with requirements under the NBIS. The Metrics are included later in this document.

Each metric consists of the following five parts:

1. NBIS component to be reviewed (NBIS Reference)
2. Evaluation Criteria
3. Compliance levels
4. Assessment levels
5. Commentary

Each metric is assessed and classified into one of the four defined levels of compliance:

- Compliant - Adhering to the NBIS regulation.
- Substantially Compliant - Adhering to the NBIS regulation with minor deficiencies that do not adversely affect the overall effectiveness of the program and are isolated in nature.
- Noncompliant - Not adhering to the NBIS regulation, thus failing to meet one or more of the Substantial Compliance criteria for a metric. Identified deficiencies may adversely affect the overall effectiveness of the program.
- Conditionally Compliant - Taking corrective action in conformance with an FHWA approved PCA in order to achieve compliance with the NBIS.

Each Division conducts an annual assessment for each of the 23 metrics at either the Min-AL, Int-AL, or InD-AL. The metric assessment levels are determined at the discretion of the reviewer based on the consideration of risk, with the following exceptions:

- Following the completion of a PCA, the corresponding metric is assessed at either an Int-AL or InD-AL.
- Following the completion of a IP, the corresponding metric should be assessed at the Int-AL.

- When knowledge, awareness, or data indicate a new or unknown compliance issue, reassess at the Int-AL during the current year or the following year.
- Metrics considered as having a higher risk at the national level, when identified by the NBIPOT, are assessed at an InD-AL using nationally developed guidelines as needed to clarify review steps.

The following actions result from each compliance level:

- Compliant (C): No follow-up action is required; document and share commendable practices.
- Substantially Compliant (SC): Issues are corrected within 12 months using an Improvement Plan, unless the deficiencies are related to issues that would most efficiently be corrected during the next inspection.
- Noncompliant (NC): A Non-Compliance letter is issued leading to development of a Plan of Corrective Action.
- Conditionally Compliant (CC): State is operating under an approved Plan of Corrective Action. Compliance levels are further defined below in Section IV.

When communicating results of the NBIP reviews to the public, these compliance determinations are classified into bridge inspection program performance levels. The Compliant and Substantially Compliant compliance levels are combined into the Satisfactory performance level, followed by Conditionally Compliant equating to an Actively Improving level, and Non-Compliant becoming the Unsatisfactory level. The three performance levels are:

- Satisfactory – C or SC
- Actively Improving – CC
- Unsatisfactory – NC

Because the metrics are assessed as discrete elements of the State's NBIS program, many times the assessment of one or more metrics may be completed before another metric assessment has even begun. Share the results of each assessment with the State as soon as possible, especially if compliance issues are found. This will allow the maximum time to address any identified concerns.

Assessments are normally an iterative process, where the results of one step determine what the next step will be. For example, the reviewer creates the MAR reports when the most current NBI data is available. The reviewer furnishes the MAR information to the State to verify the data and determine the specific circumstances. The State may provide the reviewer with documentation showing the bridges were inspected within the required timeframe, but the dates were incorrectly entered into the NBI. The reviewer can then resolve the MAR data accordingly and make appropriate compliance determinations.

Annual Review Schedule

The reviewer assesses each metric for NBIS compliance. Per the notice, the annual review cycle begins on April 1 through March 31. Key review cycle dates and associated actions are:

- April 1: The reviewer begins planning review. The NBIP review cannot begin until the State's NBI submission has been accepted.
- June - December: The reviewer conducts the compliance review, assessing each metric.
- December 31: Pursuant to 23 U.S.C. 144(h)(4), the reviewer determines the compliance level for each metric and notifies the State of the review results on or prior to this date. If a PCA has not already been developed and accepted to address the compliance issues, the reviewer issues a Non-Compliance letter to the State documenting noncompliant items.

Communication of the compliance levels to the State should be well before this to allow the State to prepare any PCA or IP. The State has 45 calendar days to submit an acceptable PCA. The expectation is that the reviewer completes the NBIP review by this date with all FSM information finalized and recorded in SMART, including attachments. In the FSM, the December 31 Summary Complete box should be checked by this date.

- March 31: The reviewer makes a final compliance determination for each metric. The reviewer should provide to the State a report documenting the compliance status of each metric. The reviewer may want to prepare a more formal report from the FSMs to submit to the State that may be more easily understood. Otherwise, a standard FSM report from the FSM dashboard in SMART could serve this purpose.
  In the FSM, the March 31 Summary Complete box should be checked by this date.

A suggested Annual Division Schedule and Checklist is included on the SharePoint site which provides specific review items and recommended dates for completion during the program year.

Metric 5 Year Review Cycle

The NBIP reviews are completed on a 5-year cycle. During years 1, 2, 3, 4, and 5, the Divisions perform the annual reviews and reassess metric risks each year based on knowledge gained from each review. Consider the following while developing the 5-year review strategy:

- Assess each of the 23 metrics annually at the Min-AL if an Int-AL or InD-AL is not to be performed that year.
- Assess each of the 23 metrics at the Int-AL or InD-AL at least once within the 5-year cycle. As discussed above, additional Int-ALs may be required under certain conditions.
- The assessment level for metrics with higher risk will vary at the discretion of the Division Office from Min-AL, Int-AL, or InD-AL, or as directed at the national level.

During year 5, Divisions will also examine the 5-year review history to identify trends in each metric area. Goals of this review are:

- To identify any gaps in the program or review process,
- To develop a review strategy for the next 5 years, and
- To document trends and issues and best practices. (Details are provided below).

Completing a new metric baseline review (i.e. reviewing every metric at the Int-AL) may be necessary based on an evaluation of State program's deficiencies as determined by the Divisions, or as directed at the national level. Examples of situations where this may be appropriate include when a new reviewer assumes oversight responsibilities, when the State DOT has undergone a major reorganization resulting in a shifting of responsibilities, or when a national assessment of the program calls for higher level reviews of all metrics. Discuss new metric baselining with the BSE, prior to planning, to confirm the need.

A spreadsheet tool to assist with planning the 5 year metric review cycle is available on the NBIP SharePoint Site.

Risk Analysis

The NBIP Compliance Reviews use a risk-based approach to determine metric assessment levels. The reviewers decide how to include a risk-based approach in this process. Consider soliciting input from the State, as appropriate. Information on risk analysis for metric assessment level assignments can be found in the NBIP Process Flow chart on the NBIP SharePoint site.

State Participation

The FHWA is responsible for performing the NBIS compliance review. To conduct an effective review, FHWA should invite the State to participate, particularly in the field review portion. The involvement of State bridge inspection personnel, especially those in a leadership role, has proven over the years to benefit not only the review, but also the relationship between the FHWA Division and State DOT. Reviewing items together helps foster a common understanding of the issues and facilitate acceptance of results and implementation of any needed program improvements. Information can be gathered by holding interviews with inspection personnel to discuss inspection practices, best practices, inspector needs, etc. Many parts of the review, such as data or file reviews, may not readily lend themselves to cooperative participation but, when feasible, FHWA should invite the State to participate. Given its compliance review responsibilities, FHWA maintains the leadership role in the review and is responsible for documenting the findings. State participation in the review should be acknowledged in the Final Summary of Metric narrative, but it should be clear that this is FHWA's assessment of the State's NBIS compliance, not a joint FHWA/State assessment.

Local Agency Participation and Review

The reviewer is responsible for reviewing the NBIS compliance of the State program. State programs vary regarding responsibility for local agency owned bridges. While national consistency is important, the reviews should also reflect the unique ownership situation of each State. Some States own and maintain all the bridges within their boundaries. Other States only own and maintain a portion of the bridges, with local agencies having ownership and maintenance responsibilities for the remainder. The populations associated with the NBIP review include all bridges in the State, except federally owned bridges. This includes local agency owned bridges. Federally owned bridges are assessed separately by Federal Lands Highway Engineers. As with State participation, local owner participation ensures effective review and is helpful in emphasizing the importance of the NBIS to the owners. Interaction with the local agencies will provide more insight into the specifics of the bridges, including the capabilities of the agency to maintain its bridges as well as how the state provides oversight of the delegated responsibilities. Although the FHWA reviewer is responsible for conducting the review of locally owned bridges in the State's population, overall inspection responsibility for all the bridges in the State ultimately resides with the State. Where there are known issues with local agency programs, the reviewer may consider performing a separate review to understand the extent of the issues associated with the local program. The State PM should be involved in this review.

Findings of Noncompliance

The reviewer issues a signed letter or report notifying the State of any noncompliant items by December 31 (23 U.S.C. 144(h)(4)). Upon receipt, the State has 45 calendar days in which to correct the deficiency or submit a PCA to the reviewer. The reviewer will then have 45 days to review and accept or reject the PCA. If the State does not submit a PCA within 45 days or the PCA does not address the noncompliance issues, the final compliance determination for that metric is noncompliant.

An alternative method to address metrics in Non-Compliance is to informally notify the State well in advance of the December 31 deadline of potential noncompliance with a metric, requesting a PCA to address the deficiency, with the intent that an acceptable PCA is signed and accepted by the Division prior to December 31. This is in lieu of issuing a Non-Compliance letter to the State. All PCAs must be coordinated with the respective BSE. In order to exercise this flexibility, the State must provide FHWA with adequate time (45 days) for proper review of the PCA.

IV. The Metrics

The metrics are used to assess each State's compliance with the NBIS. Each metric is assessed individually and with equal importance. The following is a list of 23 metrics, each related to a specific NBIS regulation, which has been established to provide an assessment of compliance with the NBIS.

- Metric #1: Bridge inspection organization: 23 CFR 650.307
- Metric #2: Qualifications of personnel--Program manager: 23 CFR 650.309(a) & 650.313(g)
- Metric #3: Qualifications of personnel--Team leader(s): 23 CFR 650.309(b) & 650.313(g)
- Metric #4: Qualifications of personnel--Load rating engineer: 23 CFR 650.309(c)
- Metric #5: Qualifications of personnel--Underwater bridge inspection diver: 23 CFR 650.309(d)
- Metric #6: Routine inspection frequency--Lower risk bridges: 23 CFR 650.311(a)
- Metric #7: Routine inspection frequency--Higher risk bridges: 23 CFR 650.311(a)
- Metric #8: Underwater inspection frequency--Lower risk bridges: 23 CFR 650.311(b)
- Metric #9: Underwater inspection frequency--Higher risk bridges: 23 CFR 650.311(b)
- Metric #10: Inspection frequency--Fracture critical member: 23 CFR 650.311(c)
- Metric #11: Inspection frequency--Frequency criteria: 23 CFR 650.311(a)(2), (b)(2), (c)(2), (d)
- Metric #12: Inspection procedures--Quality inspections: 23 CFR 650.313(a) & (b)
- Metric #13: Inspection procedures--Load rating: 23 CFR 650.313(c)
- Metric #14: Inspection procedures--Post or restrict: 23 CFR 650.313(c)
- Metric #15: Inspection procedures--Bridge files: 23 CFR 650.313(d)
- Metric #16: Inspection procedures--Fracture critical members: 23 CFR 650.313(e)(1)
- Metric #17: Inspection procedures—Underwater: 23 CFR 650.313(e) & (e)(2)
- Metric #18: Inspection procedures--Scour critical bridges: 23 CFR 650.313(e) & (e)(3)
- Metric #19: Inspection procedures--Complex bridges: 23 CFR 650.313(f)
- Metric #20: Inspection procedures--Quality Control/Quality Assessment: 23 CFR 650.313(g)
- Metric #21: Inspection procedures--Critical findings: 23 CFR 650.313(h)
- Metric #22: Inventory--Prepare and maintain: 23 CFR 650.315(a)
- Metric #23: Inventory--Timely updating of data: 23 CFR 650.315(a), (b), (c) & (d)

Each metric consists of five parts: (1) NBIS component to be reviewed; (2) evaluation criteria; (3) compliance levels; (4) assessment levels; and (5) commentary.

NBIS Component to Be Reviewed

This section of the metric shown as "NBIS Reference" identifies the relevant provisions of the NBIS and focuses in on a small portion of the larger inspection program. Compliance is assessed on the portion in focus.

Evaluation Criteria

This section of the metric shown as "Criteria" identifies the criteria that are used to evaluate compliance.

Compliance Levels

Each of the 23 metrics is annually assessed by FHWA and assigned one of four compliance levels -- Compliant, Substantially Compliant, Noncompliant, or Conditionally Compliant -- based upon specific measures and thresholds for each compliance level identified in each metric. The degrees of compliance and resulting actions are described above and repeated here:

Compliant--Adhering to the NBIS regulation.

Substantially Compliant--Adhering to the NBIS regulation with minor deficiencies, as set forth in each of the metric requirements. These deficiencies do not adversely affect the overall effectiveness of the program and are isolated in nature. Documented deficiencies are brought to the State's attention with the expectation that they are corrected within 12 months or less, unless the deficiencies are related to issues that would most efficiently be corrected during the next inspection. Per the notice, an Improvement Plan describing corrective action(s) by the State is required.

Noncompliant--Not adhering to the NBIS regulation, in general, failing to meet one or more of the Substantial Compliance criteria for a metric. Identified deficiencies may adversely affect the overall effectiveness of the program. Failure to adhere to an approved PCA is also considered noncompliance. Metrics which remain noncompliant will invoke the penalty for noncompliance per 23 U.S.C. 144(h)(5).

Conditionally Compliant--Taking corrective action in conformance with an FHWA approved PCA in order to achieve compliance with the NBIS. Deficiencies, if not corrected, may adversely affect the overall effectiveness of the program. Metrics which are determined to be conditionally compliant will not invoke the penalty for noncompliance.

Actions taken to address findings of Substantial Compliance and Noncompliance, respectively, are as follows:

Improvement Plan (IP)--A written response by the State which documents the agreement for corrective action(s) to address deficiencies identified in a Substantial Compliance determination. The completion timeframe for such agreements is limited to 12 months or less, unless the deficiencies are related to issues that would most efficiently be corrected during the next inspection cycle.

Plan of Corrective Action (PCA)--A written document prepared and submitted by the State and approved by FHWA describing the steps that are taken and timelines to take those actions in order to correct noncompliant NBIS metrics. The term "corrective action plan" in MAP-21 is interchangeable with PCA. An agreed-upon PCA for a noncompliant metric removes the possibility of a penalty based upon that metric.

FHWA's Office of Bridges and Structures (HIBS) classifies each metric compliance level into performance levels that it shares in reports with external stakeholders such as Congress, other government agencies, or the media. The Compliant and Substantially Compliant compliance levels are combined into the Satisfactory performance level, followed by Conditionally Compliant equating to an Actively Improving level, and Non-Compliant becoming the Unsatisfactory level. The three performance levels are defined as:

Satisfactory--Adhering to the intent of the NBIS regulation. There may be minor deficiencies, but these deficiencies do not adversely affect the overall effectiveness of the program and are isolated in nature.

Actively Improving--A PCA is in place to improve the areas identified as not meeting the requirements of the NBIS.

Unsatisfactory--Not adhering to the NBIS. Deficiencies exist that may adversely affect the overall effectiveness of the inspection program.

Assessment Levels

Each FHWA Division will conduct the yearly compliance review for each metric at one of three assessment levels. Assessment levels define the scope of FHWA's review necessary to make a compliance determination for a specific metric. For some metrics, field reviews are required. There are three assessment levels:

Minimum Assessment Level--A review based on information from past assessments and the reviewer's knowledge of the current practice as it relates to the metric. At the Min-AL for all metrics, knowledge and awareness of the program areas must be maintained each year to a reasonable degree, through possible ways such as periodic discussions with the State Program Manager (PM) or staff, attendance of State bridge inspection program meetings, or review of revisions to manuals, to remain aware of changes in key personnel or program policies that may affect each metric. In general, the compliance determination from the previous year or previous Int-AL review should remain, unless new knowledge is gained for the metric area affecting compliance or if a specific finding such as lack of resolution of an overdue inspection would lower the previous compliance status. Compliance determinations should not be raised based solely on an individual specific finding such as positive resolution of overdue inspections, if there remains a previous issue not yet corrected. During the review if the reviewer becomes aware of an issue which may result in a compliance determination change, an Int-AL review should be performed.

Intermediate Assessment Level—In addition to the methods described in the Min-AL, the reviewer uses more intensive methods such as random sampling of inspection records, analysis of bridge inventory data, site visits, interviews, and review of documentation to determine compliance. For those metrics that utilize random sampling, the Int-AL involves Tier 1 random sampling using a margin of error (MOE) of 15 percent and a level of confidence (LOC) of 80 percent to review bridge records. A Tier 2 random sampling, utilizing a MOE of 10 percent and LOC of 80 percent, is used when the results of the Tier 1 sample are inconclusive. Random samples are selected from the population identified for the specific metric. Refer to the article on Populations and Sampling for additional information.

Perform an Int-AL review of all metrics Statewide at least once every 5 years to ensure compliance with the NBIP. For example, if last done in PY2013, it must be re-done by PY2018 except in rare cases as approved by the BSE. The Int-AL reviews are encouraged more often than every 5 years when needed or desired to fully ascertain performance or compliance of all entities of a State. The 5-year period for Int-AL should only be exceeded upon concurrence with the BSE.

Statewide assessment is generally required for all procedure metrics (13-21), except for Metric 12. The Int-AL may <u>not</u> be accomplished in multiple years by reviewing a subset of population.

It is acceptable to perform Int-ALs for several or all metrics requiring a sample for file review in one year for efficiency.

Int-AL reviews should be done the year following a Min-AL review in which the review or other knowledge indicates regression in the State's performance. For long term PCAs, Int-AL reviews are encouraged during a PCA as necessary to fully ascertain progress of a PCA. The Int-AL is required immediately after completion of a PCA and encouraged after completion of an IP.

In-depth Assessment Level—This level is the most intensive and is used to supplement the methods described in the Int-AL with larger random sample sizes, more interviews, or research of records and documentation, and/or history. There are two ways to perform an InD-AL: Division and nationally directed. For the Division InD-AL reviews, the reviewer develops guidelines in addition to the Int-AL as appropriate for the metric or issue being assessed, with concurrence from the BSE, and conducts the review in accordance with guidelines. The coordination with the BSEs is necessary to assure national consistency for the process.

For the nationally directed InD-AL reviews, the guidelines are based on an established national focus area. The HIBS will provide specific direction and guidelines to the reviewer, and clarify the procedures to be followed to ensure national consistency.

Commentary

Complementary to each metric page is a Commentary section. The Commentary provides the reviewer insight and background into applicable sections of the metric regarding "how" or "why," often including some likely scenarios or examples. Use of the information in the Commentary improves consistent assessment of the metric. The commentary provides further information and addresses some of the unique or grey areas when reviewing the metric. Failure to read the commentary may lead to misinterpretation of the metric and possible incorrect compliance determinations.

The Commentary is organized with section headings corresponding and in the same order as specific sections from the Metrics Page. In addition, a "General" category begins each commentary with information which is more wide-ranging in nature and doesn't apply to a specific heading such as "Compliance levels" or "Assessment levels". Lastly, a "Background/changes for PY 2018" section is included at the end of each Commentary which provides a brief synopsis of the changes made during the PY2018 update.

Please remember to read the metrics and the commentary!

V. Metric Assessment Reports (MARs)

The Metric Assessment Reports (MARs) analyze the current NBI year submission of data to assess its metric compliance level. Additionally, the MARs identify compliance deficiencies that must be resolved as necessary prior to completing the metric assessments. The MARs exist for Metrics 6-11, 13, 14, and 18.

Data

The MARs include all bridges for the metric population, and are intended to be based on the most recent and previous NBI submissions. Documentation regarding generation of MARs is located on the NBIP SharePoint Site under Forms, Tools and Examples as MARGen – Metric Assessment Report Generator. The *NBIP – MARGen Instructions* document provides step by step directions on how to generate a MAR. The MARs are based on NBI data, which has some known limitations for determining compliance. The results of the initial MAR should be reviewed and discussed as early as possible with the State DOT, and the final MAR should be updated if appropriate based on current NBI data provided by the State DOT. The expectation is the MARs be generated within 30 days of acceptance of the NBI data by the National Bridge and Tunnel Inventory Engineer.

Coordination with State

Each Division is unique, and a standard resolution process may not apply to all. However, in general, the Division should work with the State DOT to minimize the State's effort during the MAR resolution process. Where possible, the reviewer should make every attempt to review bridge files themselves, documenting actual inspection dates, load ratings, or postings for the bridges in question, to the extent necessary to verify the compliance determination. However, if the State is more comfortable reviewing and providing the resolution themselves, that is acceptable with reviewer review/verification of the resolutions.

Review and discuss the initial MAR results with your State DOT as early as possible once available in the review year. This will allow for timely actions to be taken to resolve the identified safety deficiencies.

Resolving MARs

The NBIP - MAR Resolution Guidance provides guidance on how the MARs should be resolved. There are distinct differences between the MARs regarding to what extent deficiencies need to be resolved, due to differing thresholds and criticality of the identified compliance deficiencies.

Resolve all overdue inspections from the MARs 6-10, and all posting and closure status deficiencies from MAR 14 within 30 days of generating the MAR. Overdue bridges should be inspected as soon as possible. When resolving the data for MAR 6-10, use the appropriate code for the override and comment. Two safety related checks (Operating rating between 2.7 and 19.9 MT, and not posted; and Item 41 = B, posting required but not implemented) provided during the NBI processing error check should be promptly communicated to and resolved with the State DOT. Correction of these errors should not be postponed due to waiting for the generation of the MAR 14.

Note that the deficiencies identified in MARs 6-10 as "Inspection Interval Exceeded" and the Metrics 13 and 18 as "Compliance Deficiencies" need only be resolved to satisfy that the snapshot accurately reflects the compliance status. Consideration should be given to perform a supplemental analysis using current data where changes in procedures have occurred recently that may substantially affect the compliance status. The MAR 11 only needs to be resolved to the extent of determining whether the metric is C or SC. If a State has a policy in place for more frequent inspections, the lowest compliance level which may be assessed is SC.

Once all the required deficiencies have been resolved and the MAR has been resolved to accurately reflect the compliance status of the metric, work with your State DOT to pursue appropriate corrective action to address any identified compliance issues, if they still exist.

Documenting in SMART

For the FSM, identify if the MAR was resolved and, if not, provide a detailed explanation of the deficiencies. Document the findings from the MAR and identify actions taken to resolve compliance issues where they exist. Attach a .pdf copy of the "Snapshot" MAR Summary sheet (MAR tab) and the MAR "Overrides" (use the Preview and Print Overrides button) to the Attachments library in SMART, associating the document with the appropriate Metric FSM.
The compliance determination shown on the MAR Summary Sheet must not be lower than the compliance level for the FSM. Therefore, the MAR Summary should not indicate NC and the FSM shows SC or C. The opposite can be true if, for example, the MAR shows C but another aspect of the metric is assessed at SC or NC; in such a case the lower compliance determination governs. The MAR may show NC and the final metric determination may be CC due to a PCA being executed.

A copy of the resolved MAR Excel file (but no need to attach to SMART) should be retained in the reviewer's files.

VI. Separate State DOT and Delegated Agency Reviews

These guidelines are provided for the reviewer's consideration when deciding on whether to conduct a single review, or a separate State DOT and delegated agency (local or other agency) reviews. As every State's bridge inspection program is unique in some ways, whether organizationally, procedurally, or in some other aspect, careful consideration should be given to this decision.

There are many reasons for conducting separate reviews. A leading reason is to get a more representative picture of the State DOT inspection program, the local inspection program, or both. For example, in performing a single review in a State with 25,000 total bridges, of which 5,000 are State DOT owned and 20,000 local/other agency owned, a random sample will over represent the local/other agency bridges, resulting in a State DOT bridge sample size of about only 4 bridges. Toll Authorities may be a public-private partnership and operated for profit and are another example of when a separate review may need to be considered.

Some metrics may not be appropriate for separate reviews as they are usually related to State DOT functions and procedures, but this may vary depending on individual State program organizations, procedures, and known risks within the program. Two metrics that may not be appropriate for separate reviews are:

- Metric #1 – Organization
- Metric #2 – Qualifications – Program Manager

Guidelines for determining whether to perform separate State and delegated agency reviews:

- State bridge inspection organization:
    - Separating review may be desirable if:
        - Inspections are delegated to local or other agencies.
        - The quality of bridge inspection programs of State DOT and delegated agencies differ greatly.
        - Delegated inspections are administered by separate State DOT units.
        - There are disproportionate numbers of State DOT and delegated agency bridges – outside of a 60-40 split either way. Example: 4,000 State DOT bridges and 18,000 delegated bridges.
        - Delegated agencies use different inspection procedures than the State DOT.
    - Separating review may not be desirable if:
        - Inspections are not delegated (all or nearly all bridges are inspected by State DOT inspectors/consultants).
        - Delegated inspections are administered by the same State DOT unit or units.
        - There are fairly equal numbers of State DOT and delegated bridges - within a 60-40 split either way. Example: 6,000 State bridges and 7,000 delegated bridges.
        - Delegated agencies use the same, or similar, inspection procedures as the State DOT.
    - For situations in between those above, careful consideration should be given to whether separating reviews is appropriate. The reviewer may want to consult with their BSE for advice to assure consistent application amongst neighboring States.
- Review work load - Since the entire State bridge population is to be considered during the 5-year review cycle, separate reviews may increase the work load (number of metrics to perform Int-AL each year) required for performing the review. However, spread over the 5 year NBIP review cycle, this increase should be manageable.

    - For example, with separate reviews, a metric could be reviewed at the Int-AL for State DOT bridges in one PY (delegated agencies at the Min-AL). In the next PY, the delegated agency bridges would be reviewed at the Int-AL (State DOT bridges at the Min-AL). In the remaining years of the review cycle, that metric would be done for both State DOT & delegated bridges at the Min-AL.
- Final Summary of Metric - when separate reviews are performed, the FSM can summarize the metric separately. However, the summary must address both State DOT and delegated programs for each review year, with one overall compliance determination for each metric governed by the lower of the two compliance levels.
    - In the example above, when an Int-AL is performed on the State, the FSM would include a detailed summary for the State bridges, a brief summary for the Min-AL delegated agency review, and a conclusion covering both.
- Since the State DOT is responsible for NBIS compliance, the State DOT must develop and implement all required PCAs and IPs. The PCA or IP can include specific actions developed and planned for implementation by a delegated agency or agencies, as well as statewide actions, as appropriate. Status reporting would be done through the State DOT.
- Additional consideration should be given to how other (non-DOT) agencies, such as toll authorities, other State agencies, etc., would be incorporated in separate reviews.
- Separate reviews may require additional effort in generating and filtering MAR reports to correspond with the agencies being reviewed. Resolution of inspection issues may also require additional effort.

Before deciding whether to conduct a single review, or separate State DOT and delegated agency reviews, please consider the desires of your State DOT and consult with your Division management and Bridge Safety Engineer.

VII. Populations & Sampling

Since random sampling is a critical part of the NBIP review process, and for consistency of reviews, use the NBIP Sampling Tool to determine samples. It is located on the same SharePoint site as all other NBIP tools and guidance referenced above.

Establishing Populations

In most cases, all NBIS-applicable bridges within the State's boundaries, except for federally-owned bridges, are included in an annual review population, including local, toll authority, and other agency bridges.

At the Min-AL or Int-AL reviews of Metrics 12 and 22, a geographic subset (subdividing by District or region, for example) may be used, as it can reduce the amount of travel required in a given year. Each subset should represent a unique population. Review all subsets in the entire State at least once during the 5-year review cycle in order to adequately assess the entire program.

The reviewer must document the plan for review by subsets each year under extent of review in the FSM. Geographic subsets should include all owning agencies within that subset, except for special cases such as review of only local agencies in a given year as discussed in Section VI. Rotation of subsets around the State in less than 5 years may be advantageous, allowing flexibility to focus the remaining year(s) of the cycle on reassessment of certain areas or a Statewide sample to gain an overall perspective. An issue with subsets is that the compliance level only may be assessed for that smaller population. Additionally, the issues in one subset ought to be discussed with the State to verify the issues are isolated to the partitioned area. Example: If a PCA is required for the prior year's findings, hence being Conditionally Compliant, and the following year the metric is determined to be Compliant in another subset, then highest compliance level that the metric can be is still Conditionally Compliant until the PCA has been completed.

A Statewide sample is generally required for all procedure metrics (13-21), except Metric 12 and 22. The Int-ALs cannot be accomplished in multiple years by reviewing a subset of population each year.

In some cases, when performing a more focused Int-AL in addition to the Statewide review, a separate review of a population subset, or partitioning, such as for local agencies or particular Districts, may be appropriate.

The NBIP Sampling Tool is a MS Excel based application that was developed for use by the reviewers and other staff in developing the random samples for use in the NBIP Metric reviews. The Tool assists the reviewer in identifying metric specific bridge populations, efficiently combining the populations, and developing the random samples to be used in the review of each metric. The Tool also produces the Field & File Review Checklist forms for the sample bridges. By default, the Tool is set up to sample the entire State bridge inventory, but through the various filtering capabilities it can also be used for separate State DOT and local agency reviews, partitioning of the State, and other sampling methods.

The Sampling Tool is located on the NBIP SharePoint site under "Forms, Tools, and Examples" side bar under the folder "NBIP Review Process". Download the zip file with the current version of the Sampling tool. This zip file has all the files needed to develop samples, a bridge map, and file and field review forms. The Sampling Tool Instructions file is also in the Sampling Tool folder.

The Sampling tool is used to select the random samples for Int-AL file reviews for Metrics 13-19, 21, and 23, and for field review selection of Metrics 12 and 22. State identified bridges with critical findings (Metric 21) are not reported to the NBI, so those bridges are identified outside of the Sampling Tool and must be imported into the file as per the Identify M21 Population button. The Tool develops a single random list of the total population to allow combining the metrics for as much overlap as possible, thereby reducing the total number of bridges to be reviewed. Where applicable, it also selects a subset of bridges selected for file review to be included in the field reviews. Use of the tool is important for maintaining consistency in sampling for the NBIP review.

Random samples for most metrics can be established from the Sampling tool. However, several metrics may require samples to be developed from other data sources, such as lists of Team Leaders (Metric 3) or Underwater Bridge Inspection Divers (Metric 5). The Sampling Tool cannot be used to develop these samples; however, the same principles apply.

Required Standards for NBIP random sampling:
The Sampling tool establishes samples for each of the metrics which requires sampling. Outside of the Sampling tool, the Sample Size Table below should be used to establish the number of bridges to be reviewed. For the Int-AL for Metrics 13-21, and the Min-AL for Metrics 12 and 22, any sample size at or above the minimum required Tier I may be used, but the reviewer must document the level in the FSM and discuss it with the State prior to beginning the review.

To determine initial (Tier 1) and Tier 2 sample sizes for Intermediate AL:

- Define the population
- Use a LOC at 80% and a MOE at 15% for Tier 1
- Use a LOC at 80% and a MOE at 10% for Tier 2

To determine initial (Tier 1) and Tier 2 sample sizes for In-depth AL:

- Define the population
- Use a LOC at 90% and a MOE at 15% for Tier 1
- Use a LOC at 90% and a MOE at 10% for Tier 2

When establishing a random sample outside of the sampling tool for metrics other than 13-19, 21 and 23, use MS Excel random value function [=RAND()] or one of many web sites: www.random.org. Note that in using the Excel function, the random numbers will recalculate whenever a change is made to the spreadsheet. To keep static random numbers, the spreadsheet numbers must be copied and pasted as values.

How to Use the Sample Size Table:

- Find the row where the population is equal or just less than the value for a defined LOC and MOE; select the sample size in that row.

Any population over the maximum value in each column does not increase the sample size listed; select the sample size in that row.

Sample Size	Populations			
	Intermediate AL - (LOC of 80%)		In-depth AL - (LOC of 90%)	
	Tier 1 - (MOE of 15%)	Tier 2 - (MOE of 10%)	Tier 1 - (MOE of 15%)	Tier 2 - (MOE of 10%)
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	7	6	6	6
7	9	7	8	7
8	11	8	9	8
9	14	9	11	9
10	17	10	13	10
11	21	13	15	12
12	27	15	17	13
13	34	17	20	15
14	43	19	24	16
15	57	21	26	18
16	80	24	29	19
17	123	26	34	21
18	235	29	37	23
19	Over 1,248	32	44	25
20		35	50	27
21		39	58	28
22		42	68	31
23		47	80	33
24		52	95	35
25		57	116	37
26		63	144	40
27		70	187	42
28		77	257	45
29		86	395	48
30		97	794	51
31		109	Over 14,154	54
32		124		57
33		142		60
34		165		64
35		193		68
36		232		72
37		286		76
38		366		81
39		498		85
40		759		91
41		1,512		97
42		Over 27,668		103
43				110
44				117
45				125
46				133
47				142
48				152
49				163
50				176
51				189
52				205
53				222
54				242
55				264
56				290
57				321
58				358
59				401
60				456
61				521
62				613
63				733
64				906
65				1,173
66				1,642
67				2,684
68				Over 6,991

Guidance for Tier 2 Sample Size:
A Tier 2 sample size decreases the Margin of Error (MOE) from 15% to 10%, providing an increased certainty that the results obtained are applicable to the selected population. When assessing compliance to the metrics, there are situations where this increased certainty is desired by the State, FHWA, or both.

A Tier 2 sample is recommended when a Tier 1 sample indicates either marginal Substantial Compliance (SC) or marginal Non-Compliance (NC). In both of these cases, a Tier 2 sample can often clarify the issue because of the increase in LOC and decrease in the MOE, showing either a higher degree of SC, or a more distinct level of NC. Such results would typically be more defensible, and can also better accommodate a State that requests a larger sample to achieve SC. In the latter case, the reviewer may assess a Tier 2 sample upon request by the State or agency if there is a reasonable possibility that this would change the result from NC to SC. Likewise, if a Tier 1 sample produces a result that the reviewer has reason to believe is not reflective of the population under examination, then a Tier 2 sample should be taken.

For example, if a State has a review population of 1800 bridges, then the Tier 1 sample size is 19. For a certain metric, if 95% of the records sampled are required to meet criteria to achieve SC, then 18 of 19 (94.7 or 95%) are required to achieve this level. If 18 meet these criteria, and more certainty of SC is desired by the reviewer, then a Tier 2 sample of 42 can be taken. Since 40 or more of 42 will satisfy the 95% requirement, if no more disqualifying records are found in this sample, then 41 of 42 or 97.6 (98) % is achieved and more clearly meets the requirement for SC.

In the example above, if the Tier 1 sample had revealed only 17 of 19, or 89%, meeting the metric criteria, this would indicate a finding of NC. At either a request from the State or at the discretion of the reviewer, a Tier 2 sample may reveal no additional bridges failing to meet the criteria, resulting in 40 of 42, or 95%, which would support a finding of SC in this case. However, if the Tier 2 sample revealed additional failing bridges, such as a result of 38 of 42, or 90%, this would more clearly demonstrate a finding of NC for the metric.

In all three variations of the above example, the Tier 2 sample would provide higher confidence in the compliance determination for the metric. A Tier 2 sample is generated with the Sampling Tool. The reviewer may select a sample size larger than Tier 1 but other than Tier 2, but the size and reason must be documented in the FSM, and the State must be informed, prior to beginning the review.

File Review Bridge Selection
Bridges for file reviews are required to be identified using the Sampling Tool. The bridge numbers are sorted by random number and should be selected in the order presented.

Field Review Bridge Selection
Bridges for field reviews are required to be identified using the Sampling Tool, and are a subset of the file review bridges. The number and selection of the field review bridges is based on a statistical random sample size, consistent with other metrics. Unlike the random samples for file reviews, the field sample is based on criteria built into the Sampling Tool to ensure selection of a sample of bridges with diverse risk factors, conditions, and other characteristics, then selected in order of the random numbers generated by the tool.

For the field review, the Sampling Tool selects bridges from the overall population of each of the procedure metrics (Metrics 13, 14, 16-19, 21) reviewed at the Int-AL. The instructions identified in the pop-ups in the Sampling Tool should be followed in the order presented to assure correct selection of the bridges.

The Sampling Tool will produce a randomized list based on a predetermined set of factors and, if desired, based on the reviewer's selected (filtered) geographic region. The sample size at the Tier 1 level will likely be between 15 and 19 bridges, depending on the population of State bridges and the sub-population chosen for the geographic area under review. The reviewer should remove any bridges that have been removed or replaced, or are impractical for review, then use the tool to select the next one on the randomized list. Recently closed bridges may warrant a visit but may be excluded also. Reason for removal of any bridge from the original randomized list should be documented in the *Extent of Review* section of the FSM in SMART. A larger sample size than Tier 1 may be selected, but if not Tier 2, the size and reason must be documented in the FSM, and the State must be informed prior to beginning the review.

Discuss with your BSE if there are unique situations.

Field review and file review forms

The Sampling Tool has the capability to automatically generate both prepopulated field review forms and prepopulated file review forms for those bridges selected for field reviews and for bridges selected for Int-AL file review. Instructions for creating these forms are included in the user guidance for the Sampling Tool. These forms should be used to document your findings from the file and field reviews.

Mapping

The Sampling Tool has the capability to automatically generate a map file that is viewable in Google Earth showing the location of all the selected field review bridge locations. The latitude and longitude recorded in the NBI are used to map the bridge location using Google Earth. Therefore, if the State only collects latitude and longitude for NHS bridges, since this is only required for NHS bridges, the map will be incomplete.

The mapping feature will save the data as a 'kml' data file. Saving the data will allow mapping later without using the Sampling Tool, and to import the data in other software (such as Google Maps, Bing Maps). After opening the map file, Google Earth will also prompt to save the mapped data. If the data is saved, the mapped bridges are available in Google Earth without using the Sampling Tool. Mapped bridges can be printed from Google Earth, Google Maps, Bing Maps, or other mapping software.

VIII. File Review Guidance

The "bridge file" is the repository of all information and data elements of a bridge owner's bridge inspection and inventory program for a particular structure.

Ultimately, a bridge file:

- contains documents considered legal records - Per Section 4.7 Commentary of the AASHTO MBE
- documents decisions that were made in relationship to the bridge. These decisions include maintenance and repair activities; engineering judgment used; other relevant actions
- houses current bridge inspection reports and other pertinent calculations and historic information
- verifies/validates NBIS compliance – file verifies/validates data in NBI

Bridge files contain the findings and results of previous bridge inspections. This information, as well as the listed information above, is critical for the team leader to perform an inspection properly. The bridge file provides historical knowledge that helps the team leader in assessing how the bridge or a component is functioning over a period of time.

The reviewer assesses compliance for several metrics by reviewing information contained in files. The review for these metrics requires the bridge file to contain the information as described in the AASHTO MBE.

As outlined in Section 2 of the AASHTO Manual (MBE), the bridge file contains a wide range of information applicable to bridge inspection, which may be located in more than one location. However, the bridge file should reference the location of all required data, if not contained in one physical or electronic file. The list of applicable bridge file components for Metric 15 is as follows:

- Inspection reports
- Waterway information – channel cross sections, soundings, stream profiles
- Significant correspondence
- Special inspection procedures or requirements
- Load rating documentation, including load testing results
- Posting documentation
- Critical findings and actions taken
- Scour assessment
- Scour Plan of Action (POA) (for scour critical bridges and those with unknown foundations) and documentation of post event inspection or follow up
- Inventory and evaluation data and collection/verification forms

Also, as per the NBIS, bridge files are expected to 'maintain relevant maintenance and inspection data to allow assessment of current bridge condition.'

During either an Int-AL or InD-AL as appropriate, the following metrics will include a review of randomly selected bridge files for the following components at a minimum. Refer to the individual metrics and their commentary for more detail.

- Metric 13 – Inspection procedures – Load Rating – review bridge files to verify that load rating calculations or documented determinations exist, all legal vehicles were considered, and load ratings are consistent with current conditions, including verification of the SI&A data. Any SI&A data inconsistencies should be assessed under Metric 22.

- Metric 14 Inspection procedures – Post or Restrict – review the bridge files to verify that the documentation shows posting is properly implemented and corresponds to the load rating recommendation. This may include verifying that the postings were timely installed within State requirements. Any field findings can supplement the file reviews and be applied directly to the compliance determination for Metric 14.
- Metric 15 – Inspection procedures – Bridge Files – Ensure that the State and local bridge owners are maintaining bridge files in accordance with the requirements of the NBIS and AASHTO; significant bridge file components exist; if some components are only referenced, verify the components exist in the referenced location(s) and are readily available.
- Metric 16 – Inspection procedures – Fracture Critical Members – verify that sample FCM bridge files contain inspection procedures that correctly correspond with current bridge conditions and configurations, and the FCM inspection report indicates the bridge was inspected according to those procedures. Any field findings can supplement the file reviews and be applied directly to the compliance determination for Metric 16. Metric 17 – Inspection Procedures – Underwater – review bridge files to verify that files contain UW inspection procedures that correctly correspond with current bridge conditions and configurations, and the UW inspection report shows that the bridge was inspected according to those procedures. Any field findings can supplement the file reviews and be applied directly to the compliance determination for Metric 17.
- Metric 18 – Inspection procedures – Scour Critical Bridges – review bridge files to verify that scour evaluations are documented, consistent with bridge conditions, and properly assess scour vulnerability. Also, verify that POAs are developed and documented for those that are scour critical or have unknown foundations including verification that the POA was followed during recent triggering storm events.
- Metric 19 – Inspection procedures – Complex Bridges – review bridge files to verify that bridges have identified specialized inspection procedures that correctly correspond with current bridge conditions and configurations, and that any additional inspector training and experience has been identified and met. Also, verify that documented procedures were followed. Any field findings can supplement the file reviews and be applied directly to the compliance determination for Metric 19.
- Metric 21 – Inspection procedures – Critical Findings – review bridge files as appropriate to ensure that actions taken and documentation were in accordance with the established procedure, and that proper notifications of critical findings were provided; Determine whether the bridge should have qualified under the State criteria as a critical finding.
- Metric 23 – Inventory – Timely Updating of Data – verify bridge SI&A data is updated in the 90/180 day timeframes.

The reviewer should use the NBIP File Review Checklist forms to document findings for each bridge file that is reviewed. The NBIP File Review Checklist is generated and prepopulated by the Sampling tool for Int-AL or InD-AL.

Relative to the process of reviewing State or local bridge files for NBIS compliance, the following process should be used:

- Create random sample of bridge files to be reviewed from a Statewide population. The reviewer should refer to Section VII - Populations and Sampling, for details on how to create a random sample for the bridge file review.
- Review the File Review Checklist and the metric to identify metric and inventory items to be reviewed during file review.

- Work with the State or local bridge owner to gain access to files.
- Review files for completeness relative to required information, completing the appropriate File Review Checklist form.
- Assess the level of compliance based on the findings.
- Review findings with the State DOT or local bridge owners, if a finding of NC or SC notify State so that the State can develop plans of corrective action or improvement plan.

File reviews, including review of inspection reports, should typically be done prior to the field review. There may be instances where it may be appropriate to field confirm findings from the file review. However, the sequencing of the field and file reviews is up to the discretion of the reviewer, who may see benefit in performing the field review prior to the file review.

During the file review, some items may be found as deficient that are not part of the sample. If a non-safety issue is discovered during file reviews related to a metric only being reviewed at the Min-AL and therefore not requiring a sample, the State should be notified of the finding so it can be addressed before the next review year. This finding should not affect the compliance determination for that metric in the current year, but consider performing an Int-AL in subsequent year.

If the issue is a high-risk safety issue (posting, closure, critical finding, unqualified TL, and overdue inspections), the State must address the issue immediately and the reviewer should consider upgrading the review to an Int-AL in the same review year to verify the extent of the problem. If the reviewer is not able to perform an Int-AL in the current review year, an Int-AL review should be performed the subsequent review year. If the high-risk safety issue is addressed immediately by the State after notification, the issue would not have an impact on compliance determination of the associated metric. Subsequently, if the issue is not resolved in a timely manner, the compliance should be adjusted accordingly.

For instance, the file review may be confirming existence of fracture critical procedures for Metric 16 under an Int-AL. During the file review the reviewer identifies that the scour plan of action is missing from the bridge file. If Metric 18 is only being reviewed at the Min-AL, the deficiency and eventual resolution should be documented in the FSM and the State informed of the missing scour plan of action in the file. The State should further investigate the existence of a POA for that bridge and assure a POA exists in the file. However, this is not a compliance issue relative to Metric 18, but may indicate a larger issue and that an Int-AL should be planned for the next review year.

IX. Field Review Guidance

Field reviews serve an important purpose as part of FHWA's NBIP assessment process. They provide FHWA with an opportunity to determine, to the extent possible, if the structure data and findings documented in the inspection reports and files are consistent with observed field conditions. It is understood that determinations made from field reviews are often limited to checking for gross inconsistencies between documented findings and observed conditions due to time restrictions and perhaps limited access. However, insight into the overall quality of an inspection can be gained from a field review, as well as overall effectiveness of the inspection program from multiple field reviews.

Field reviews are not intended to be complete and thorough bridge safety inspections in accordance with the NBIS. Rather, the purpose is to spend enough time at the bridge to allow a reasonable assessment of the overall quality of the most recent official bridge inspection for each type of inspection. The purpose is to verify, to the extent practical, the previous inspection findings and condition assessments, for the accessible parts of the bridge. If findings are noted that cannot be confirmed, assume the findings to be accurate. However, if the reviewer finds defects or deterioration not documented in the inspection report, this may be an inspection quality issue. If there is reason to believe that the defect/deterioration may not have existed at the time of the last official inspection, it probably should not be an inspection quality issue. Further investigation through interview may be appropriate in this case.

To discuss possible compliance issues, including how the inspection team actually accessed and inspected the bridge, the State DOT and, if appropriate, local agency is strongly encouraged to participate on all field reviews. Additionally, assistance from a coworker in your Division Office can provide valuable experience for that person. Having multiple individuals on site also assists in the personal safety for all. DO NOT GO OUT ALONE!!!!

If a follow-up site visit is needed to review any issues that may have been missed or found during the file reviews, it is good practice to notify the State DOT which bridges are planned to be visited on that day. This will prevent any embarrassing situations with State DOT staff or law enforcement questioning your presence under the bridge.

No matter the number of metrics or the particular metrics being assessed at the Int-AL or InD-AL, the items listed below should always be assessed or verified when at a bridge site:

- Consistency of the recorded inspection date(s) with observed field conditions, looking for obvious inconsistencies or indications that the date(s) may be incorrect, and confirmation that a full NBIS inspection has been completed;
- Validation between the documented condition ratings and the observed conditions, keeping in mind the time that has elapsed from the most recent inspection to the date of field review;
- Proper procedures were utilized during the inspection, including access to inspect all areas, and evidence of the presence of a team leader, especially apparent if the inspection is taking place during the field review;
- Consistency between the existing load rating data and observed conditions;
- Presence and location of posting signs, if required;
- Key SI&A data outlined in Metrics 12 and 22 is up-to-date and accurate;
- Overall thoroughness, accuracy, and/or quality of the inspection and the inspection report. As the value of the condition code decreases, the amount of documentation should increase to thoroughly describe its location, extent, and significance.

If a high-risk safety issue (posting, closures, critical finding, unqualified TL, and unresolved overdue inspections) is found in the field related to a metric only being reviewed at the Min-AL, the State must address the issue promptly, and the reviewer should consider upgrading the review to an Int-AL in the same review year to verify the extent of the problem. If the reviewer is not able to perform an Int-AL in the current review year, an Int-AL review should be performed the subsequent review year. If the critical safety issue is addressed immediately by the State after notification, the issue would not have an impact on compliance determination of the associated metric. Subsequently, if the issue is not resolved in a timely manner, the compliance level should be adjusted accordingly.

As an example, Metric 14 is being assessed at the Min-AL. While in the field reviewing bridges for Metrics 12 and 22, inaccurate posting signs are found at a bridge. The State is notified of the posting deficiency and the signs are replaced. The finding would not affect the Metric 14 compliance determination for the current review year. However, this finding should be further discussed with the State as an area of improvement, and document that this metric should receive an Int-AL or InD-AL in the following review year. If the signs were not replaced, Metric 14 would be assessed as NC until a PCA was executed, but every attempt should be to address this safety issue.

Conversely, issues found during field reviews which relate to procedure metrics identified for Int-AL during the review year should be applied directly to the compliance determination for that metric. For example, a bridge is selected for field review in a year in which Metric 16 was selected for Int-AL. Upon examination in the field, the bridge had inadequate fracture critical inspection procedures with more than minor deficiencies. This deficiency should be used in the evaluation of the compliance determination, and Metric 16 assessed as NC until an adequate PCA was executed.

Bridges outside the sample may be field reviewed during the year to verify other issues, but in most cases the findings should not be used in conclusions on the entire population for the metric review. Instead, the findings should be addressed individually with the State or agency.

It is acceptable that those bridges requiring excessive effort or cost due to geography or accessibility not be included in the field review subset. Where accessibility is essential to thoroughly conduct an assessment (i.e., evaluation of the use of fracture critical member inspection procedures, underwater inspection procedures, or complex bridge inspection procedures), the availability of special access equipment could be negotiated with the State. If special access equipment is not available to the reviewer, a meaningful assessment can often still be made without full access to all elements or spans, and conclusions made should take into account the difference in access between the reviewer and the inspector. If little or no access is available, at a minimum, review the inspection report notes to verify the comments listed justify the condition ratings.

Even if there is limited access for conducting an inspection, visiting a bridge site has additional benefits, as posting signs may be found missing, major settlement could have occurred, or the bridge rail or approach guardrail may have been damaged since the last inspection. The State should be notified of any recently developed safety issue.

Field Review expectations

The minimum suggested equipment for field reviews is that reviewers have at least an inspection hammer/pick, a high intensity flashlight, a camera, tape measure, waders/muck boots, and binoculars. Also, a scour pole is very handy and perhaps necessary in many instances. It is very

useful in walking down slopes, through vegetation, and into shallow streams. It is used to probe under footings to check for scour and undermining.

Wading into streams with substantial depth and velocity is not required nor recommended for field reviews unless the reviewer is properly trained, equipped and experienced. If the depth cannot be determined, do not enter the waterway. Stream currents can be deceptively powerful. Brush and other underwater hazards can exist. Streambed materials can often be very slippery or very soft. Extreme caution is urged when venturing into these areas.

Various bridge inspection techniques are taught. Some say the inspector should follow the load path and water flow, which requires starting with checking for general alignment by sighting along the railings or curb, then by inspecting the joints and deck, working down to the substructure. Every inspector has their own preferences. The main focus should be to act in a safe manner during bridge inspections, always being aware of your surroundings. Always face traffic, and don't become complacent or too comfortable around high speed traffic, fast moving water flows, or even amongst wildlife.

Below are some examples of reviewer level of effort for field reviews for typical scenarios.

Typical Local/Rural Structure over Stream:
Many local/rural structures have low ADT and easy access. In these cases, it is expected that the entire bridge be closely inspected visually, with care taken going down slopes to access the underside of the bridge. Occasionally, the best access to get below the deck may be some distance from the wingwalls, such as through a corner of an adjacent field, except if posted private property. Survey the entire area prior to making your decision on access. Once at the first abutment, look visually at everything accessible or reachable (backwall, bearings, beam ends, etc.). A flashlight should be used in poorly lit areas, such as bearings and backwalls. An inspection hammer is utilized to sound suspect areas for delaminations. Photos should be used to document your review and be taken of any areas of concern. Extreme care should be taken when traversing riprap. If the stream is shallow and easily wadeable, cross the channel and perform similar review on the opposite site. If too deep, access the other side by crossing the bridge on top if it can safely be done. If only part or one side of the underside can be accessed, compare only the conditions of the observed portions with the inspection report.

Once back on top of the bridge, walk the deck and assess visually, from the sidewalk or shoulder. Face traffic and continue to pay close attention to any oncoming traffic. Take measurements as necessary to confirm inventory information, if this can be done safely. Hammering and sounding of the bridge deck is typically not expected. If there are suspect areas, sound those areas of the deck with a hammer, but only if traffic gaps allow this to be done safely.

Urbanized or Complex Bridge Access:
If a sampled field review structure is in a major city with high traffic volumes, access can be very difficult. For such bridges, expectation is to only inspect areas safely accessible. The inspection should begin at one corner of the bridge. Use of binoculars is effective in this situation. Climbing down onto the steel for arm's length inspection is not required or expected. If easy access is possible to get below to see the abutment areas and bearing areas, then the attempt should be made. For these types of structures, it is very beneficial to try and arrange for the bridge inspection team leader or owner of that bridge to be present to indicate the recommended access, i.e. how they do it. They may have knowledge of special access through businesses, locked gates or other means. If not, then use your best judgement. Finish one corner of the bridge, and then proceed to the other

three corners. Crossing the deck for a structure such as this is only recommended if there is a sidewalk. If no sidewalk, simply perform visual inspection from the ends of the bridge

Long Span Structures:
Usually, a few structures are included in the random sample will include very long structures often with high clearances. These bridges can have many spans, even hundreds of spans with total bridge lengths of thousands of feet or even a mile or more. It is not expected that all spans of the structure are visually inspected. Look at enough spans to gain some confidence in the overall condition of the structure. Effort should consist of verifying some inspections findings, dispute any lack of findings, or determine inadequate documentation in the inspection report. The inspection should start at one abutment and then walk below, if there is easy access, the entire length or until an obstruction is reached. If an obstruction is reached, backtrack and drive across the deck to the other side of the bridge. Resume your inspection at the opposite abutment and walk towards the center of the bridge. However, if the structure is excessively long and/or crosses several obstructions or roads with high speed traffic, review of the entire length is not expected. Try to focus on a few piers that have expansion joints as those areas typically can show problems. If there are multiple types of spans on the same long structure (multi-girder spans vs two-girder systems vs truss spans, etc.), efforts should be made to visually inspect each of the span types. Binoculars can be beneficial to some extent for verifying general condition of these types of structures with high clearances. Ladder access and climbing to the top of tall piers is not expected.

A key to a proper field review is to examine the written documentation in the most recent bridge inspection report. If there are comments in the report that identify locations on the bridge that have potentially serious defects, make a special effort to observe those areas as best as possible. For large structures, it is understood that many of these areas are inaccessible without specialized equipment. Use engineering judgement to decide whether the inspectors thoroughly inspected and reported appropriate findings. If State or local inspection personnel are present during the review, simply ask them how access was achieved to these locations during the actual inspection.
When field reviews are performed while observing inspection teams during active inspections, it may be necessary to plan in advance and perform such reviews throughout the review year in accordance with the State or agency inspection schedule. These field reviews offer opportunities to observe inspection teams employing their typical practices and procedures. Usually this can be accomplished by obtaining a general weekly or monthly schedule from the State Program Manager, then locating the team on a particular day. Unless the inspection is for a large bridge which will require several days for inspection, unannounced visits may not be achievable.

State, public agency and consultant inspectors are responsible for using safe inspection practices. While the FHWA does not have a specific standard, FHWA employees who participate in field review of bridges as part of the NBIS Compliance Review should follow State and OSHA safety procedures and be an exemplary advocate for safe practices. Some specific areas to emphasize are to avoid working alone, use proper personal safety gear, use extreme caution around traffic, avoid confined spaces unless properly equipped, avoid hazardous climbing, and be alert for animal hazards.

X. SharePoint Metric Assessment Reporting Tool (SMART)

The SMART is an information entry and storage tool for reviewers to record the review process and report the results of the annual Bridge Inspection Program compliance reviews to HIBS. The tool is located on the National Bridge Inspection Program SharePoint Site. The SMART page is accessible by clicking on the SMART heading on the ribbon bar or as a selection on the main page for the

National Bridge Inspection Program SharePoint Site. A variety of information is stored on the site including FSMs, PCAs, IPs and supporting documents (attachments).

Within prescribed limits, the reviewer has discretion to decide how much information they enter and store within the SMART tool. The tool may be used to document observations and activities throughout the year that may affect compliance. Entries are stored by Performance Year (PY). Previous documentation of all entries is useful to refer to and understand how the individual steps in the review were completed.

It is very important to maintain all the files which contain all the supporting information that served as the basis for the review in the Division. The NBIP Review files should be organized and housed to assure they are accessible to Division personnel, such as a Division Share drive, not on a personal or local drive. If in the future there is a change in personnel or more information is needed or questions arise, the reviewer's NBIP Review files are crucial for addressing such inquiries.

Accessing SMART

The SMART is located in the FHWA NBIP SharePoint site. If you do not already have access to the NBIP SharePoint site, you will need to contact your BSE to get access permission. The SMART page is accessible by clicking on the SMART heading on the ribbon bar or as a selection on the main page for the National Bridge Inspection Program SharePoint Site.

SMART Organizational Structure

SMART has several major Components. They include Pages, Lists and Libraries. The folders under each component are as follows:

- PAGES
  - Front Page
  - FSM Dashboard
  - PCA Dashboard
  - IP Dashboard
  - Review Notes
- LISTS
  - FSM - Final Summary of Metric
  - PCA - Plan of Corrective Action
  - PCA Activities
  - IP - Improvement Plan
  - IP Activities
  - Notes (Formerly Observations)
- LIBRARIES
  - Attachments

SMART Attachments

The SMART has the ability to attach documents that relate to FSMs, PCAs and IPs. Attachments support the statements made in your Observations and Findings in your FSMs. Attachments can be a variety of file types including PDFs, Excel files, Word files, text files, emails, photos, etc. When attaching a document to SMART, be sure to follow procedures to identify the proper "metadata" which are used to establish a unique identity that allows for better querying and sorting. This allows for consistency in the association of attachments that allow for use in internal processes of SMART.

Documents which must be attached to SMART to reflect your FSMs are listed in the Attachments in SMART Requirements document. Below are some examples:

- List of sample bridges and populations (Sampling Tool excel file).
- MAR excel file.
- PCAs/IPs.

Other documents that may be attached but are optional include:

- A summary of your file review.
- A summary of your field review.
- Key examples of State work products.
- Key correspondence (emails, letters, memos, etc.).
- PCA correspondence (transmittal letter from State and acceptance letter from the Division).
- Progress reports for PCA activities that are underway/completed.

Final Summary of Metric

A FSM is required for each metric. Each FSM contains the Division's assessment of that portion of the State/Federal agency's Bridge Inspection Program. Each FSM summarizes the review process, findings and actions taken, including (if applicable) any findings which resulted in a substantial or Non-Compliance determination, and (if applicable) commitments made by the State to address substantial or Non-Compliance determinations.

An FSM's primary purpose is to document and communicate to HIBS a summary of the review on that portion of the State's Bridge Inspection Program. Collectively, all of the FSMs (one for each metric) provide a comprehensive view of the status of the State's Bridge Inspection Program. In addition to HIBS communication, FSMs can be sent along with a cover letter to the State Agency to convey in writing the results of the annual compliance review.

The FSM is a short summary of information, so it is often necessary to provide the State with more information than what is shown in an FSM, especially when addressing Non-Compliance findings. Nonetheless, the FSM represents a good starting point for this communication. However, in the event that the State is required to develop a Plan of Corrective Action, the reviewer may need to share more information and detail with the State regarding why the metric was found in Non-Compliance.

As discussed above, FHWA is required to notify States in writing of the Compliance Determinations for each Metric by December 31st each year. The FSM can be used for this purpose or the reviewer may develop their own summary report. In the latter case, FSMs would serve as the basis for writing a summary report.

A quality FSM is a standalone document, specific to each metric and each year. It should stand on its own merits. It is imperative that the FSM provide enough detail to document and support the final compliance determination. Examples of FSMs are in the Forms, Tools and Examples folder on the NBIP SharePoint site. The FSMs from past reviews may also be accessed in the SMART. The following seven bullets contain the key information (as applicable) that the reviewer must enter for each FSM:

1. Extent of the Review – Briefly describe the methodology used to evaluate the metric.
    - For those metrics which require sampling, document the population and random sample size. Identify the method used to perform random sampling.

- Document if the State was partitioned or separate reviews were performed for local agencies.
- Provide detailed information on locations or people chosen for review.
- If NBI data is referenced, identify date and source of the data.
- Summarize the steps taken to evaluate the metric so that the reader has a sense of the breadth and intensity (scope) of your review.

2. Observation – An objective reporting of the review results and a discussion of what those results mean.
   - Describe the results of field and file reviews, personnel interviews, and resolution of MARs.
   - Attach a list of the bridges that were field and/or file reviewed (if applicable).
   - Include a description and resolution of any flagged items on the MAR Reports.
   - If the State is under an existing PCA (from a prior year), summarize whether the State is fulfilling the requirements described in their PCA.
3. Findings – Compliance issues that were uncovered in the review that would lead to a NC finding or a recommendation for improvement, SC.
   - Summarize any issues that indicate SC or NC.
   - If the State is under a PCA but is not on track, summarize what was found.
4. Conclusion – State the basis for your compliance determination.
   - Clearly identify the factors that support your determination, refer to the compliance criteria for each metric as shown in the metrics language.
   - For Compliance, this could be as simple as "this review found that State X meets all of the compliance criteria for this metric".
   - For other than compliance, more detail is needed – "Since the review determined that less than 80% of inspections reviewed met the criteria for quality, this metric was found in Non-Compliance"
5. Recommendations – Identify actions that need to be taken to address Non-Compliance or Substantial Compliance findings. If there are no recommendations, just leave this box empty or type "Not Applicable".
   - Summarize action(s) the State must take to correct issues documented in the Findings section.
   - Recommendations may be given that do not directly impact the compliance determination for this metric, but if so should be so stated.
6. Compliance Determination - State the compliance determination.
   - It is usually a drop-down box with four options.
   - Complete for December 31 and March 31.
   - Includes the check box for Summary complete box
7. Resolution - Complete for metrics that have a change in compliance status or require follow-up activities after the December 31st compliance determination; as applicable, describe those activities.
   - Actions taken since the initial determination to address the deficiencies noted.
   - This may also present a second conclusion in the cases where the compliance determination has changed since the initial determination.

All of the above information must be entered in SMART and sent to the State in writing by December 31st.

By March 31, the reviewer attaches to SMART any new or revised PCAs or IPs, updates the actions and finalizes all FSMs in SMART, documenting the Final Compliance Determinations for the Performance Year.

Often due to the Division organizational structure, the DBE works alone in completing their review with little to no review other than their own proof reading. Although it would be impossible to retrace the track taken by the DBE in completing their review, it is recommended that the DBE seek to have their FSM reports reviewed by another Division Bridge Engineer. This review may be valuable for identifying errors, and may also provide some assurance to the DBE that they are following the NBIP process consistently.

Plans of Corrective Action and Improvement Plans

The PCAs and IPs are activities that are addressed after the final determination has been made. Activities after final compliance determination are covered in the Bridge Program Manual Chapter 2. Guidelines for development of Improvement Plans are in Section 2.3.2. Guidelines for development of Plans of Corrective Action are in Section 2.3.4.

XI. Background for Changes effective May 2017

The 5-year National Bridge Inspection Program (NBIP) oversight process cycle was completed in March 2017. The FHWA has previously committed to review the NBIP oversight process to apply lessons learned since the April 2013 update and update it as necessary for the PY2018 review cycle. For this reason and to improve the clarity and consistency of NBIP oversight metrics, including addressing questions and suggestions for changes, limited revisions have been made to the metrics. Other more comprehensive changes have been identified in consideration of a future revision, but are not included here. The 2017 revisions are designed to align with the 2014 Notice and are effective May 1, 2017, for the review year PY2018.

The majority of revisions to the wording of the metric language and associated commentaries clarify the compliance level's relationship to the applicable provisions of the NBIS, and better relate the steps at each assessment level to the compliance level criteria.

These clarifications along with limited modifications to steps required at each assessment level and certain sampling procedures should reduce confusion and overall workload among reviewers conducting the reviews, while improving the consistency and effectiveness of the reviews performed.

Reasons and goals for revisions can be summarized as follows:

- Commitment to review the process at end of 5-year cycle;
- Apply lessons learned since the April 2013 update;
- Better focus on highest risk process issues and program areas;
- Clarify areas of known confusion and misunderstanding;
- Improve the quality and effectiveness of reviews;
- Improve national consistency of process while maintaining flexibility;
- Reduce overall burden through streamlining and realigning assessment steps to ensure level of effort is commensurate with level of risk.

The metric updates should have little to no effect on compliance determinations, and it is anticipated that no metric will have an existing compliance level move into non-compliance due to any of these changes.

Specific metric revisions are summarized in the commentary for each metric, and a general summary is given below.

XII. Summary of Updates to the Metric Review Process

The following general criteria affects several metrics, or in some cases a slight change in review approach or emphasis:

Criteria:

- The Criteria language (NBIS requirements) was adjusted for a limited number of metrics as necessary to more directly adhere to the language in the NBIS regulation. As a result, some criteria requirements were reduced, resulting in a corresponding reduction in the items measured to determine compliance. In a few cases, a compliance measure was adjusted to better match the NBIS requirements, but these changes are not expected to result in more stringent requirements for achieving compliance.

Compliance Levels:

- The measures for Substantial Compliance were adjusted for a few metrics to better align with the general definition of SC: "The act of adhering to the NBIS regulation with minor deficiencies. These deficiencies do not adversely affect the overall effectiveness of the program and are isolated in nature". These changes did not result in a more stringent requirement for achieving SC.

Assessment Levels:

Adjustments to some assessment levels were also made to improve consistency and to better match the level and intensity of review to the level of risk or benefit gained.

- The Min-AL language for all metrics was modified to emphasize the need for the reviewer to maintain their knowledge and awareness of the specific program area as to any changes in personnel, practices, and progress on Plans of Corrective Action (PCAs) or Improvement Plans (IPs) through such ways as periodic discussions with the PM or staff, attendance of State bridge inspection program meetings, and review of revisions to manuals.
- The resolution of all potential data inconsistencies indicated in the Metric Assessment Reports (MARs) have been removed from the Min-AL, with the exception of overdue bridge inspections, and are now included in the Int-AL to better align with the level of effort expected at the Min-AL. This reduces the unnecessary burden of assessing repetitive information every year. Emphasis is placed on a review of MAR summaries at the Min-AL for any new issues or trends toward non-compliance that may be developing. As such, the scheduling of an Int-AL review during the current or next review year is expected to further assess and resolve the issue.
- The Int-AL was adjusted for some metrics to more consistently include interviews and data analysis with file reviews for a random sample of bridges, as applicable to adequately assess performance. Previously some review techniques were inconsistently included under either the Min-AL or the InD-AL.
- The InD-AL was updated for all metrics to provide for either specific national direction when necessary, and for a customized approach where the reviewer defines criteria with concurrence from the BSE, providing more flexibility to Divisions in responding to various compliance issues that arise. The coordination with the BSEs is necessary to assure national consistency for the process. This is a fundamental change to move the InD-AL to one that is a deeper review when necessary, and not just a broader review.
- Clarifications and further examples were added to the commentary to consolidate guidance given since the April 2013 version into one location.

- Sampling methods for all affected metrics were adjusted to allow more flexibility, still requiring the existing 80% LOC/15% MOE as a minimum, but allowing reviewers to increase the sample

size level to best suit any unique issues. The modification from the minimum sample size should be coordinated with the State, documenting the sample size and the reasons for increasing the sample size before the review begins.

Other Significant/Specific Metric Updates

Refer to the specific metrics to refer to all changes. Most significant changes are summarized below:

- Metric 4 (LR Engineer): Introduced an SC measure where previously there was none, to capture instances where the LRE exists and is qualified, but does not have total overall responsibility for load rating of bridges, or the degree of responsibility is not clear.
- Metric 5 (Inspection Divers): Introduced an SC measure where previously there was none, to capture instances where although all divers listed are qualified, it is unclear whether all inspection divers were listed due to inadequate documentation of all divers participating in inspections, therefore making it uncertain whether all divers were qualified.
- Metrics 6 – 10 (Frequency): Updated at the Min AL to no longer require resolution of all possible deficiencies listed on the MAR, but instead to resolve the highest safety risk of Overdue bridges (those where data indicates the inspection is past due and has possibly not yet been re-inspected). The Int-AL was modified to require the resolution of the remainder of deficiencies listed on the MAR. The Commentary was modified to allow for minimal number of low risk bridges to be inspected beyond the interval plus 4 months for SC for Metrics 6 and 8.
- Metric 11 (Frequency criteria): Formalized the metric criteria established in 2015 to resolve deficiencies listed in the MAR at the Min-AL, but now updated to require only at the Int-AL. Resolution of the MAR is limited to determining whether the compliance level is C or SC. Added criteria under Int-AL to perform a random sample to verify increased frequency criteria is being followed by the State.
- Metric 12 (Quality Inspections): Revised this metric to make the selection of field bridges based on a randomized sample, to be more consistent with other metrics, replacing a semi-random method of selecting 20 bridges from a larger sample. The sample is based on criteria built into the FHWA Sampling Tool, related to aspects determined to reflect higher risk that includes selection of some bridges of certain types and in fair to poor condition, in a random order to ensure national consistency. Clarified that Min-AL includes verification of the use of MBE procedures, and Int-AL includes field verification of one active routine inspection to verify team leader presence and MBE procedures are followed. Verification of the use of State bridge-specific procedures during the field reviews, such as Fracture Critical, is assessed under M12, not the applicable procedure metric. Quality of bridge-specific procedures is assessed under the applicable procedure metrics, primarily through file review, but are also, during an Int-AL, verified in the field to ensure the procedures are logical for the particular bridge.
- Metric 13 (Load Rating): Revised to no longer require resolution of all possible deficiencies listed on the MAR at the Min-AL; moved most resolution to the Int-AL. Certain load rating safety checks that are part of the acceptance of the annual NBI data submittal were removed from the review.
- Metric 14 (Posting): Certain load posting safety checks are part of the acceptance of the annual NBI data submittal were added as a measure in the review.
- Metric 18 (Inspection Procedures – Scour): Revised to no longer require resolution of all possible deficiencies listed on the MAR at the Min-AL; moved most resolution to the Int-AL. This metric now applies to all bridges over water when assessing completion of scour evaluations, not just bridges evaluated as scour critical or otherwise requiring Plans of Action (POAs) to monitor scour.

National Bridge Inspection Program Metrics

NBIP Metrics Glossary

Acronyms and terms used in this document

Compliance Levels

Compliance	C
Substantial Compliance	SC
Non-Compliance	NC
Conditional Compliance	CC

Assessment Levels

Assessment Level	AL
Minimum Assessment Level	Min-AL
Intermediate Assessment	Int-AL
In-Depth Assessment	InD-AL

Other acronyms and terms

AASHTO Manual for Bridge Evaluation	AASHTO Manual or MBE
SharePoint Metric Assessment Reporting Tool (FHWA NBIP tool)	SMART
Bridge Safety Engineer (FHWA)	BSE
Continuing Education Unit	CEU
Division Bridge staff reviewer	reviewer
Federal Highway Administration	FHWA
FHWA Headquarters Bridge Office	HIBS
Fracture Critical Member	FCM
Improvement Plan	IP
Load and Resistance Factor Rating (method)	LRFR
Load Factor Rating (method)	LF or LFR
Load Rating Engineer	LRE
Metric # Assessment Report	MAR#
National Bridge Inspection Program	NBIP
National Bridge Inspection Standards	NBIS
National Bridge Inventory	NBI
National Highway Institute	NHI
National Highway System	NHS
Not to exceed	NTE
Plan of Action (Scour)	POA
Plan of Corrective Action	PCA
Professional Engineer	PE
Program Manager	PM
Quality Assurance	QA
Quality Control	QC
Specialized Hauling Vehicle	SHV
State or Federal Agency	State
Structure Inventory and Appraisal	SI&A
Team Leader	TL
Underwater	UW

Metric #1: Bridge inspection organization rev 5/1/17

NBIS Reference: 23 CFR 650.307 – Bridge inspection organization

Criteria

- An organization is in place to inspect, or cause to inspect, all highway bridges on public roads.
- Organizational roles and responsibilities are clearly defined and documented for each of the following aspects of the NBIS: policies and procedures, QC/QA, preparation and maintenance of a bridge inventory, bridge inspections, reports, and load ratings.
- Functions delegated to other agencies are clearly defined and the necessary authority is established to take needed action to ensure NBIS compliance.
- A program manager (PM) is assigned the responsibility for the NBIS.

Population: Not applicable.

Compliance Levels

Compliance (C): All of the following must be met for C:

- The organization is in place and effective as indicated by assessment of the other 22 metrics.
- Organizational roles and responsibilities are clearly defined and documented.
- Delegated functions are clearly defined with the necessary authority established.
- Responsibility for the NBIS is assigned to a PM.

Substantial Compliance (SC): All of the following must be met for SC:

- The organization is in place and effective as indicated by assessment of the other 22 metrics; minor deficiencies in the organization exist but do not adversely affect the overall effectiveness of the program and are isolated in nature.
- Organizational roles and responsibilities are clearly defined and documented; isolated deficiencies exist but do not adversely affect the overall effectiveness of the program.
- Delegated functions are defined with authority established to resolve safety issues.
- Responsibility for the NBIS is assigned to a PM.

Non-Compliance (NC): One or more SC criteria are not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Assess based on previous review results, the reviewer's knowledge and awareness of the bridge inspection program, and from the current assessment of the other metrics.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Verify that responsibility for the NBIS is assigned to a PM, and that documented organizational roles, responsibilities, and delegation procedures exist as applicable.
- If functions are delegated, assess effectiveness of the process through interview of PM and some individuals with delegated functions.
- Assess overall effectiveness of organization through assessment of other metrics and interview of PM.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – review in accordance with national direction and guidelines.

Metric #1: Commentary rev 5/1/17

General: This metric determines if the State or Federal Agency (State) has an appropriate organization in place, and if the organization is effective as indicated in part by assessment of the other metrics. Therefore, this metric may not be fully assessed until the remaining metrics are fully assessed.

Phrases in italics below are repeated from the metric language, with further explanation provided.

Criteria: The phrase **'***Functions delegated to other agencies are clearly defined'* means each State office, District office, contractor, or other entity must be given clear direction for assigned or delegated roles or tasks. For example, a State district office with a delegated PM and inspection teams must understand the extent of their duties and how they are communicated and relate to the main PM in the central office.

The phrase **'***…the necessary authority is established to take needed action to ensure NBIS compliance'* means the organization must have agreements with other owners to establish the proper authority necessary to ensure the NBIS is carried out correctly. The State is highly encouraged to establish such agreements in writing. An example of inadequate authority is a State law that prevents proper posting of bridges; this would be considered a compliance issue for Metric 1.

Compliance levels: The term *Safety issues* are those related to bridge closure, posting, critical findings, and overdue inspections. For C, the phrase '*necessary authority established'* is inclusive of these safety issues and all other aspects of delegated functions. For SC, the '*authority established* 'for these safety issues is a minimum.

If other metrics are non-compliant, conduct a careful evaluation to determine whether those non-compliance issues stem from deficiencies in the organizational structure itself. If so, then a finding of SC or NC is appropriate for this metric. This is not directly related to the number of metrics in NC or CC, but whether issues are caused by deficiencies in the organization. Another consideration is if existing PCAs are on schedule, and if not, whether the reason stems from organizational issues.

When inspection staff is not made aware of key components of organizational roles and responsibilities, this can result in inconsistencies in application of QA procedures. In such cases the metric should be considered SC due to organizational deficiency.

Another example of an organization deficiency is when a PM is assigned the responsibility for the NBIS, but with limited authority to ensure delegated agency functions are carried out due to conflicting local laws or policies. The PM has implemented an otherwise good policy to place load posting signs within a specified number of days of a load rating determination, but the bridge owner refuses to post despite repeated attempts by the PM to convince the bridge owner, and the PM is prohibited from posting the bridge directly. In this case the metric is considered NC due to the safety implications.

Assessment levels: At the Min-AL, maintain knowledge and awareness of the programs areas each year to a reasonable degree, through discussion with the PM or others, and remain aware of changes in key personnel or program policies that may affect each metric. The knowledge and awareness from the Min-AL informs whether to perform further review at the Int-AL or InD-AL.

At the Int-AL, consider interviews with individuals who have been delegated PM functions for one or more agencies, districts, consultants, etc., represented in those bridges selected for field review under Metric #12.

Metric #1: Commentary rev 5/1/17

Background/ changes for PY 2018: *Minor clarifications to wording of metric and addition of commentary to improve clarity. In-D updated for this and all metrics to provide more flexibility to Divisions in further assessment of the metric as necessary.*

Metric #2: Qualifications of personnel – Program Manager rev 5/1/17

NBIS Reference: 23 CFR 650.309 (a) – Program Manager and 650.313 (g) QC/QA

Criteria

The Program Manager (PM) must have the following qualifications:
- Professional engineer registration or 10 years of bridge inspection experience;
- Successful completion of FHWA approved comprehensive bridge inspection training; and
- Completion of periodic bridge inspection refresher training according to State policy.

Population: The individual designated as PM.

Compliance Levels

Compliance (C): All of the following must be met for C:
- The PM has the required qualifications.
- The PM has completed periodic bridge inspection refresher training according to State policy.

Substantial Compliance (SC): All of the following must be met for SC:
- The PM has the required qualifications, except a newly designated PM has not completed comprehensive bridge inspection training, but is scheduled to do so within 6 months after selection to the PM position.
- The PM has not completed periodic refresher training according to State policy, but is scheduled to do so within the next 12 months.

Non-Compliance (NC): One or more SC criteria are not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:
- Monitor PCA if in effect.
- Assess based on previous review results, and on the reviewer's knowledge and awareness of the PM's qualifications.

Intermediate Assessment (Int-AL): In addition to the Min-AL:
- Verify PM's qualifications through interview of PM or PM's direct supervisor(s).
- Review PM's qualification documentation.

In-Depth Assessment (InD-AL): Perform one of the following:
- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #2: Commentary rev 5/1/17

General: This metric evaluates the qualifications of the designated State PM, not any other staff members that may have delegated PM duties. The designated PM is ultimately responsible for all aspects of the Program, even if some duties are delegated to districts, consultants, local agencies, or others.

Compliance levels: The term *designated PM* refers to either an acting assignment or a permanent assignment of an individual to the position.

If a PM or an acting PM is qualified, but there are issues relating to lack of overall responsibility, sufficient authority, or effectiveness, this affects the compliance determination for Metric 1 but not Metric 2.

Assessment levels: If a new PM is designated, perform an Int-AL review in the same year if possible, or in the subsequent year if not.

Background/ changes for PY 2018: *Minor changes to wording of metric to improve clarity. Int-AL updated to require review the documentation of PM qualifications and to require Int-AL when a new PM is identified.*

Metric #3: Qualifications of personnel – Team Leader(s) rev 5/1/17

NBIS Reference: 23 CFR 650.309 (b) – Team leader(s) and 650.313 (g) QC/QA

Criteria

Each Team Leader (TL) must have at least one of the following qualifications:

- PE registration
- Five years of bridge inspection experience
- NICET Level III or IV Bridge Safety Inspector certification
- Bachelor degree in engineering from ABET accredited college or university, a passing score on the Fundamentals of Engineering Exam, and two years of bridge inspection experience.
- Associate Degree in engineering from ABET accredited college or university and four-years of bridge inspection experience.

In addition to the above qualifications, TLs must have the following training:

- Successful completion of FHWA approved comprehensive bridge inspection training; and
- Completion of periodic bridge inspection refresher training according to State policy.

Population: All TLs for all inspection types for inspections performed from January 1 of the calendar year prior to the beginning of the review year.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All TLs have the required qualifications.
- All TLs have completed periodic bridge inspection refresher training according to State policy.

Substantial Compliance (SC): All of the following must be met for SC:

- All TLs have the required qualifications.
- One or more TLs have not completed periodic bridge inspection refresher training according to State policy.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Assess based on previous review results, and on the reviewer's knowledge and awareness of process for monitoring TL qualifications.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Randomly sample TLs to review qualifications, including dates of comprehensive and refresher training.
- Interview the PM or supervisor to verify qualifications when documentation of qualifications is inconclusive.

In-Depth Assessment (InD-AL): Perform one of the following

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

General: This metric verifies that all team leaders listed for all types of inspections which require a TL during the identified time period are qualified. Metric #12 then verifies that TLs are on site during each bridge inspection, and that the TLs noted in the inspection reports reviewed are included on the list developed for Metric #3.

Criteria: For additional guidance on what constitutes bridge inspection experience, see the *Questions and Answers on the National Bridge Inspection Standards 23 CFR 650 Subpart C*, located at http://www.fhwa.dot.gov/bridge/nbis/index.cfm.

Population: This metric applies to all TLs for initial, routine, in-depth, fracture critical member, and underwater inspections. The population is limited to TLs that have inspected bridges from January 1 of the calendar year prior to the start of the review year (example: for the PY18 review that starts 4/1/17, include all TLs that have inspected since 1/1/16). This will minimize overlap from one review year to the next.

Compliance levels: Refresher training must be scheduled on a periodic basis. This schedule should be documented, but it does not affect compliance if it is not. If any TL reviewed has not taken refresher training in accordance with State policy, this is considered SC for this metric, notwithstanding other findings. If a TL has never taken refresher training and none is planned, this is also considered SC for this metric, and should be further assessed under Metric 20, pursuant to 23 CFR 650.313(g), which requires periodic refresher training. Such training is not specifically required under 23 CFR 650.309.

Assessment levels: For the Int-AL, use the following procedure to review TL qualifications:

1. If a list of all TLs is available, review qualifications of randomly sampled TLs from the list.
2. If no list is available, refer to the sampling tool's list of sampled bridges for Metrics 13 – 19, and 21. From this sample, in the order of the random numbers already generated, obtain the name of the TL for each bridge inspection until a sample of 19 unique TLs is obtained. If this exceeds the total number of team leaders in the State, review all team leaders.

Because the NBIS does not require a "list" of TLs, the lack of a list does not affect the compliance status for Metric 3. However, in such situations, review documented procedures used to assure that the appropriate inspection qualifications are being met.

If no effective process exists to ensure that all TLs are qualified, but the actual TLs assessed in this metric *are* qualified, this finding should be considered in the compliance determination of Metric 1, not Metric 3. Likewise, if the TLs assessed in this metric are *not* qualified and the State does not have a process to monitor TL qualifications, this finding should be considered in determining the compliance determination for both Metric 1 and Metric 3.

If one or more active TLs are found to be unqualified, the finding should be addressed. First, the PM should ensure that the unqualified individual(s) ceases TL duties. Then work with the PM to develop a plan to ensure that past inspections by the individual(s) were completed in a quality manner, through review of those inspection findings or re-inspections if necessary. The plan should also rectify any underlying process issues that cause unqualified personnel to be assigned TL duties.

If the unqualified TL was found outside the metric process, the finding should also be addressed as described above. If found when Metric 3 was scheduled for a Min-AL, then a review at the Int-AL should be scheduled for that review year if possible, or the following review year at the latest, to

more fully assess the issue. An unqualified TL is considered a high-risk safety issue, so this finding should be applied directly to the compliance level of this metric, and is considered NC. If the underlying issue is resolved by Dec 31, a compliance determination of SC or higher would be appropriate, depending on other issues if any.

If certificates of training cannot be produced and the training was provided by NHI, transcripts can be requested from NHI for courses completed within the past 7 years. Each student's transcript will show the courses attended and the number of CEUs earned – NHI does not print a new copy of a certificate. Send requests for transcripts to NHIRegistrar@dot.gov.

Verify professional engineer registration through the State's PE board website.

Background/ changes for PY 2018: *Minor improvements to wording of metric to improve clarity. Int-AL updated to require interviews of some TLs.*

Metric #4: Qualifications of personnel – Load Rating Engineer rev 5/1/17

NBIS Reference: 23 CFR 650.309 (c) – Individual responsible for load ratings

Criteria

The Load Rating Engineer has overall responsibility for load rating of bridges and is a registered professional engineer.

Population: The individual charged with overall responsibility for load rating bridges.

Compliance Levels

Compliance (C):
- The LRE is a registered professional engineer.
- The LRE has overall responsibility for load rating of bridges.

Substantial Compliance (SC):
- The LRE is a registered professional engineer.
- The LRE does not have total overall responsibility for load rating of bridges, or the degree of responsibility is not clear.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:
- Monitor PCA if in effect.
- Assess based on previous review results, and on the reviewer's knowledge and awareness of the LRE qualifications and responsibilities.

Intermediate Assessment (Int-AL): Perform the following:
- Verify qualifications and responsibilities of the LRE through interview of LRE or supervisor(s).
- Review LRE's qualification documentation.

In-Depth Assessment (InD-AL): Perform one of the following:
- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #4: Commentary rev 5/1/17

General: This metric verifies that the individual designated as the LRE is a registered professional engineer and has overall responsibility for load rating of bridges.

The LRE may be the same individual as the Program Manager and should be actively engaged in determining and communicating load rating policy, load rating QC/QA procedures, etc. Many of the duties of the LRE may be delegated to one or more individuals at lower levels or other agencies, but the overall responsibility for load rating of all bridges in the State ultimately resides with the LRE.

Compliance levels: The phrase *overall responsibility for load rating bridges* does not mean that the individual must complete or review all load ratings directly, but rather that the individual has final responsibility for establishing procedures and guidance for the load rating process in the State, including ensuring the completion of load ratings by local agencies.

A compliance determination of SC is appropriate when the LRE is a PE, but the review reveals the LRE does not have total overall responsibility for load rating of bridges, or the degree of responsibility is not clear. This can occur, for example, if an individual with a PE is designated as the LRE but does not have documented responsibility or have authority to establish necessary policies and practices.

Assessment levels: If a new LRE is designated, perform an Int-AL review in the same year if possible, or in the subsequent year if not.

Background/ changes for PY 2018: *Substantial Compliance criteria was added for this metric, to account for situations where the LRE's level of responsibility is not completely clear. The Int-AL was modified to require review of qualifications by both interviews and reviewing documentation. Minor improvements to wording of metric to improve clarity.*

Metric #5: Qualifications of personnel – UW Bridge Inspection Diver rev 5/1/17

NBIS Reference: 23 CFR 650.309 (d) – Underwater Bridge Inspection Diver

Criteria

Underwater bridge inspection divers must have successfully completed at least one of the following training courses:

- FHWA approved comprehensive bridge inspection training course
- FHWA approved underwater bridge inspection diver training course

Population: All inspection divers inspecting those bridges from January 1 of the calendar year prior to the beginning of the review year.

Compliance Levels

Compliance (C): The following must be met for C:

- All inspection divers have successfully completed FHWA approved comprehensive bridge inspection training or FHWA approved underwater bridge inspection diver training.

Substantial Compliance (SC):

- All divers listed in the inspection report are qualified, but it is unclear whether all inspection divers were listed due to inadequate documentation of all divers participating in inspections.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Assess based on previous review results, and on the reviewer's knowledge and awareness of process for monitoring underwater bridge inspection diver qualifications.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Randomly sample divers to review documentation of successful completion of required training.
- Interview PM or supervisor if necessary to verify successful completion of required training when documentation is inconclusive.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #5: Commentary rev 5/1/17

General: This metric assesses the qualifications of all underwater bridge inspection divers. The purpose is not to assess all requirements of the team leader; this is done in Metric #3.

Compliance levels: Even though all inspection divers must have completed an FHWA approved comprehensive bridge inspection training course or other FHWA approved underwater diver bridge inspection training course, divers are not required to complete refresher training, unless a diver is also functioning as the team leader for the inspection.

Any diver responsible for inspection of any element must have completed the required training. If only one diver for each inspection meets established criteria, and this diver visually and/or tactilely inspects all underwater components as the primary or only inspector, this is considered a compliance level of C. Additional divers providing support roles only, such as 'tender' divers, need not complete the training.

For SC, any divers listed in the inspection report or other inspection records must meet required qualifications, but there may be cases where all divers may not be listed. Thus, it may be unclear whether every inspection diver that participated in the inspection met the qualifications.

Assessment levels: For the Int-AL, use the following procedure for reviewing diver qualifications:

1. If a list of all divers is available, review qualifications for randomly sampled divers on the list.
2. If no list is available, refer to the Sampling Tool. Use the Metric 17 sample, in the order of the generated random numbers, to obtain the name of the divers for each UW inspection until the required sample size of unique TLs is developed.

Because the NBIS does not require a "list" of TLs and/or underwater bridge inspection divers, the lack of a list does not affect the compliance status for Metric 5. However, in such situations, review documented procedures used to assure that the appropriate inspection qualifications are being met.

If no effective process exists to ensure that all divers are qualified, but the actual divers assessed in this metric are qualified, this finding should be considered in the compliance determination of Metric 1, but not affect the determination for Metric 5.

If certificates of training cannot be produced and the training was provided by NHI, transcripts can be requested from NHI for courses completed within the past 7 years. Each student's transcript will show the courses attended and the number of CEUs earned – NHI does not print a new copy of a certificate. Send request for transcripts to NHIRegistrar@dot.gov.

Background/ changes for PY 2018: *Substantial Compliance criteria was added to account for situations where the qualifications of all divers participating in an inspection are not completely clear. Int-AL updated to include interviews of PM or supervisor if necessary to verify successful completion of required training. Minor improvements to wording of metric to improve clarity.*

Metric #6: Inspection frequency – Routine – Lower risk bridges rev 5/1/17

NBIS Reference: 23 CFR 650.311 (a) – Routine inspections

Criteria

- Routine inspections are performed at regular intervals not to exceed (NTE) 24 months, or NTE 48 months when adhering to FHWA approved criteria.

Population: Lower risk bridges for the entire State that are open to traffic, and whose inspection dates have changed since the previous year's NBI submission or are overdue.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All bridges are inspected within the required NTE 24 or 48-month interval, as applicable, unless documented unusual circumstances have caused a 1 month delay for any inspections.
- All bridges on the NTE 48-month interval meet the FHWA approved criteria.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 90% of bridges are inspected within the required NTE 24 or 48-month interval plus 1 month, as applicable.
- All bridges are inspected within the required interval plus 4 months.
- At least 95% of the bridges on the NTE 48-month interval meet the FHWA approved criteria.
- Minor deficiencies exist in the documentation process for 1-month inspection delays, or not all delays are properly documented.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Generate MAR6 within 30 days of NBI data acceptance and review to resolve overdue bridge inspections – notify the State of overdue inspections, track completion of inspections, and document result on MAR6.
- Review MAR6 Summary for indication of any new deficiencies.
- Assess based on MAR6 Snapshot and previous review results, and on the reviewer's knowledge and awareness.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Review MAR6 and resolve data for inspections that exceeded the required interval to the extent necessary to assure that the compliance status shown is correct.
- Review a sample of bridges coded for 48-month intervals from the MAR6 list of bridges, to verify they meet the FHWA approved criteria for extended intervals in the State.
- If appropriate, perform a supplemental MAR6 analysis for current year inspections using additional data obtained from the State.
- If 1-month inspection delays exist, review procedures to ensure there is a process to document unusual circumstances and that the process is being followed.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

General: The commentary for Metric 6 also applies to Metrics 7-10, except where noted.

The frequency metrics determine if bridges are being inspected per required intervals, including following FHWA approved criteria for extended intervals, as appropriate. Due to the large numbers of inspections completed each year and the number of scheduling issues that can occur, certain tolerances for each compliance level are defined in each metric.

Metrics 6 & 7 reflect low risk and high risk Routine inspections, Metrics 8 & 9 reflect low risk and high risk Underwater inspections, and Metric 10 reflects FCM inspections. FCM inspections are different from Routine inspections, and although some bridges may be considered in both metrics, the assessment is of two different inspection types. This occurs when, for example, a truss bridge is given a Routine inspection separately from a FCM inspection.

The term *overdue* means the inspection was due prior to the NBI submission date, but a new inspection date was not submitted. This typically occurs either when an inspection was done but was not recorded in the inventory data before submission, or that the inspection has not yet been done. An overdue inspection, until resolved, is considered a high-risk safety issue.

A *delinquent* inspection differs from an overdue inspection in that the inspection was completed but exceeded the required interval.

The analysis includes the 90/180 day NBIS allowance for entering data and an additional 30 days for compiling the submittal.

Population: Risk classification for Metric 6 & 7 is based on the bridge's super/substructure condition, load restriction, and scour vulnerability. NBI Items 41, 63, 64, and 70 determine load restriction risk, which helps identify posted bridges that do not require load restriction and therefore are lower risk. Lower risk criteria for Metric 6:

- NBI Item 59 and 60, or 62 > 4 and
- Either:
  - NBI Item 70 = 5 and Item 63 ≠ 5; or
  - Item 63 = 5 and Item 70 = 5 and Item 41 = A, D, or E
- And Item 113 = 4, 5, 7, 8, 9, N

Bridges adhering to FHWA approved extended frequency criteria are assumed to be lower risk.

The population of all frequency metrics is defined to eliminate review of the same inspection interval for the same bridge in successive review years. It also includes bridges indicated by the submitted data to be overdue for inspection.

Compliance levels: Compliance levels are based on several cumulative thresholds, which allow consideration of unusual circumstances that can make the completion of inspections within the required month impractical or inefficient. The percentages shown in the metric criteria section of the MAR tab represent the compliance level thresholds and are measured when performing an Int-AL.

As identified in the preamble of the NBIS regulation, severe weather, concern for inspector safety, concern for inspection quality, the need to optimize scheduling with other bridges, or other unique situations may be justifiable cause to push the inspection interval into an additional month (25^{th}/49^{th} or 61^{st}/73^{rd}). Such circumstances must be documented. These thresholds also allow for flexibility so that structures previously inspected earlier than scheduled can get back on the original schedule.

In unusual circumstances that will delay an inspection or group of inspections for more than 1 month, an assessment of C can be made if the Division has provided prior approval with concurrence from

the BSE. Prior to the inspection being delinquent, the State can request FHWA HQ to approval a time extension. If the request is approved, an assessment of C is proper if the bridge(s) is inspected by target date in the extension. Reasons for an extension include but are not limited to: permanently moving a small number of scheduled inspections of low risk bridges to better coincide with existing inspections in the same geographic area or a one-time schedule readjustment due to an unusually large or widespread natural disaster requiring a shift in existing resources.

For C (Metric 6 only), all bridges coded for extended intervals must meet the criteria approved by FHWA for that specific State. At the Int-AL, review and compare the approved criteria with the related data for bridges currently coded for 48 months.

For SC (Metric 6 only), the 5% tolerance for bridges coded for 48 month intervals is intended for those formerly meeting the specific criteria, but transitioning to a 24-month interval due to a recent change in condition or other criterion, which result in SC.

Note that for SC, a 50% threshold is included in the MAR Metric Criteria for the NTE interval. This threshold conveys an expectation that at least half of inspections should be completed on time. Failure to meet the 50% threshold should not by itself result in a non-compliance determination; it may indicate other issues for which further investigation is needed.

Assessment levels:

Min-AL: Resolve all overdue inspections as soon as possible after the NBI data is accepted and the MAR is generated. In this case, resolve means to determine if the overdue inspection has not been done or is only a data issue and take the appropriate action(s) that follow.

If the overdue inspection is a data issue, enter the appropriate override code with an explanation on the MAR data tab.

If a bridge inspection is not completed, take the following actions:

- Notify the State as soon as possible, and work with them to ensure inspection as soon as possible (within 30 days of notification is suggested). If the State does not take expedited action to perform the inspection, discuss the issue with the BSE.
- Track the date that the bridge is inspected
- Enter the appropriate override code with an explanation on the MAR data tab.
- Inform the PM that the underlying issue causing the overdue inspections must be corrected as soon as possible.

Depending on timing and the severity or extent of the underlying issue, the metric should be assessed at the Int-AL, preferably in the current review year, or at the latest in the next year, to determine the full extent of any issues related to the metric.

Document in the FSM the number of overdue bridges resolved, and any actions taken by the State to correct the underlying issue(s).

If any underlying issues are not resolved by December 31, assess as NC. If overdue inspections resulting from rare and isolated situations are completed in a timely manner, with BSE concurrence, and the underlying issues are resolved, the previous year's compliance determination applies, unless additional issues warrant a lower compliance level, or a lack of additional issues and a completed PCA lead to a higher compliance level.

At the Min-AL, compare the MAR summary tab percentages inspected within each threshold to the previous year's levels to determine if any negative trends indicate possible new compliance issues.

The MAR summary tab percentages can be shown by pressing the Toggle Assessment Level button to toggle to the Int-AL/InD-AL. Depending on the degree of the apparent compliance issue (based on unresolved summary data), a review at the Int-AL should be scheduled for either the current or the following review year.

Int-AL: Resolve all Overdue inspections as mentioned under the Min-AL, and resolve any other possible compliance deficiencies shown, such as inspections that exceeded the required NTE interval plus 1 month, until it is determined that the MAR compliance snapshot is correct. For further information on resolution of the MAR, see the NBIP – MAR Resolution Guidance.

When warranted, the review can include obtaining the most recent inspection data from the State and performing a supplemental interval analysis. Such analysis should be conducted after consultation with the State and if there is a reasonable chance that current inspections will reveal a higher level of compliance.

To perform a supplemental analysis, generate a new MAR using a current NBI data file (NBI submission file format) as the Most Recent data and the April NBI submission file as the Previous data. The supplemental analysis must cover at least 6 consecutive months or 25% of the population being reviewed, so the supplemental analysis should be performed with a current NBI data file obtained in October or later of the review year. The BSE can assist if such an analysis is needed.

For Metric 6 only, in rare and isolated situations, a small number of bridge inspections may exceed the required interval plus 4 months but no more than 12 months. If these are the only inspections that cause a finding of NC, with the concurrence of the BSE, the reviewer may assess the metric as SC and document the resolution in the MAR and FSM accordingly. Below are some examples to demonstrate this exception:

- An owner has several bridges on a 48-month frequency where the condition worsened, requiring the frequency to be reset to 24 months. The new frequency was recoded, but for two bridges the change was not reflected in the TL's schedule until the following year. Consequently, these bridges were inspected in the 36th month. This is an acceptable, isolated occurrence.
- An owner has a bridge that has been inspected late for 2 cycles in a row, by 7 months and 5 months respectively. This is not an acceptable isolated occurrence.

Metric Assessment Report (MAR): The MAR is generated using the NBIP MARGen tool that is downloaded from the NBIP SharePoint site. The MAR is typically based on the most recent and previous April NBI submissions.

Depending on the summary result, the review may require detailed examination and resolution or overriding of the data, as explained in the MAR instructions on the SharePoint site. The MAR is based on NBI data, which has some known limitations for determining compliance. A few examples include border bridges where the other State has inspection responsibility, when the time frame for processing and submitting NBI data causes some inspection data to be omitted from the submittal, or situations when the bridge has been replaced or work has been performed that changes the inspection schedule.

Background/changes for PY2018: *This metric was updated at the Min AL to no longer require resolution of all possible deficiencies identified in the MAR; only resolution of inspections identified*

as overdue is expected. The Int-AL was modified to require the resolution of all possible deficiencies or until the compliance determination is confirmed, previously required at the Min-AL.

Metric #7: Inspection frequency – Routine – Higher risk bridges

rev 5/1/17

NBIS Reference: 23 CFR 650.311 (a) – Routine inspections

Criteria

- Routine inspections are performed at regular intervals not to exceed (NTE) 24 months.

Population: Higher risk bridges for the entire State that are open to traffic, and whose inspection dates have changed since the previous year's NBI submission or are overdue.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All bridges are inspected within the required NTE 24-month interval, unless documented unusual circumstances have caused a 1-month delay for any inspections.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 95% of bridges are inspected within the required NTE 24 interval plus 1 month.
- 100% of bridges are inspected within the required interval plus 4 months.
- Minor deficiencies exist in the documentation process for 1-month inspection delays, or not all delays are properly documented.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Generate MAR7 within 30 days of NBI data acceptance and review to resolve overdue bridge inspections – notify the State of overdue inspections, track completion, and document result on MAR7.
- Review MAR7 Summary for indication of any new deficiencies.
- Assess based on MAR7 Snapshot and previous review results, and on the reviewer's knowledge and awareness.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Review MAR7 and resolve data to the extent necessary to assure that the compliance status shown is correct.
- If appropriate, perform a supplemental MAR7 analysis for current year inspections using additional data obtained from the State.
- If 1-month inspection delays exist, review procedures to ensure there is a process to document unusual circumstances and that the process is being followed.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #7: Commentary rev 5/1/17

General: The commentary for Metric 6 applies to this metric, except where noted.

Population: Risk classification for Metric 7 is based on the bridge's super/substructure condition, load restriction, and scour vulnerability. NBI Items 41, 63, 64, and 70 are used to determine load restriction risk, which helps identify posted bridges that do not require load restriction, and therefore are lower risk. Higher risk criteria for Metric 7:

- NBI Item 59 or 60, or 62 < 5 or
- NBI Item 70 < 5 or
- NBI Item 63=5 and Item 70=5 and Item 41= B, P, or R or
- Item 113 = 0, 1, 2, 3, 6, T or U

Bridges adhering to FHWA approved extended frequency criteria are assumed to be lower risk.

Background/changes for PY2018: *This metric was updated at the Min-AL to no longer require resolution of all possible deficiencies identified in the MAR, only resolution of inspections identified as overdue. The Int-AL was modified to require the resolution of all possible deficiencies or until the compliance determination is confirmed, previously required at the Min-AL.*

Metric #8: Inspection frequency – Underwater – Lower risk bridges rev 5/1/17

NBIS Reference: 23 CFR 650.311 (b) – Underwater (UW) inspections

Criteria

- UW bridge inspections are performed at regular intervals not to exceed (NTE) 60-months, or NTE 72-months when adhering to FHWA approved UW criteria.

Population: Lower risk bridges requiring UW inspections for the entire state that are open to traffic, with inspection dates changed since previous year's NBI submission or are overdue.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All UW inspections are done within the required NTE 60- or 72-month interval, as applicable, unless documented unusual circumstances have caused a 1-month delay for any inspections.
- All bridges on the NTE 72-month interval, meet the FHWA approved criteria.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 90% of UW inspections are done within the required NTE 60 or 72-month interval plus 1 month, as applicable.
- 100% of UW inspections are done within the required interval plus 4 months.
- At least 95% of UW inspections on NTE 72-month interval meet the FHWA approved criteria.
- Minor deficiencies exist in the documentation process for 1 month UW inspections delays, or not all delays are properly documented.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Generate MAR8 within 30 days of NBI data acceptance and review to resolve overdue UW inspections – notify the State of overdue inspections, track completion, and document result on MAR8.
- Review MAR8 Summary for indication of any new deficiencies.
- Assess based on MAR8 Snapshot and previous review results, and on the reviewer's knowledge and awareness.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Review MAR8 and resolve data to the extent necessary to assure that the compliance status shown is correct.
- Review a sample of bridges coded for 72 month intervals from the MAR8 list of bridges, to verify they meet the FHWA approved criteria for extended intervals in the State.
- If appropriate, perform a supplemental MAR8 analysis for current year UW inspections using additional data obtained from the State.
- If 1-month inspection delays exist, review procedures to ensure there is a process to document unusual circumstances and that the process is being followed.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #8: Commentary rev 5/1/17

General: The commentary for Metric 6 applies to this metric, except where noted.

Population: Risk classification for Metric 8 is based on substructure/culvert condition and scour vulnerability. Lower risk criteria for Metric 8:

- 92B = Y
- Item 60 or 62 > 4 and
- Item 113 = 4, 5, 7, 8, or 9

Bridges adhering to FHWA approved extended frequency criteria are assumed to be lower risk.

Compliance levels: For C (Metric 8 only), all bridges coded for extended intervals must meet the criteria approved by FHWA for that specific State. At the Int-AL, review and compare the approved criteria with the related data for bridges currently coded for 72 months.

For SC (Metric 8 only), the 5% tolerance for bridges coded for 72-month intervals is intended for those formerly meeting the specific criteria, but transitioning to a 60-month interval due to a recent change in condition or other criterion, which result in SC.

Assessment levels: For Metric 8 only, in rare situations, a small number of bridge inspections may exceed the required interval plus 4 months but no more than 12 months. If these are the only inspections that cause a finding of NC, with the concurrence of the BSE, the reviewer may assess the metric as SC and document the resolution in the MAR and FSM accordingly. Below is an example to demonstrate this exception:

- An owner has a bridge that is due for an underwater inspection and contracts with a qualified diver to inspect the bridge, but illness of the diver prevents the inspection from taking place on time. By the time the diver recovers, winter conditions further delay the inspection until spring, resulting in it being 8 months late. This would be considered an allowable isolated occurrence.

Background/changes for PY2018: *This metric was updated at the Min-AL to no longer require resolution of all possible deficiencies identified in the MAR, only resolution of inspections identified as overdue. The Int-AL was modified to require the resolution of all possible deficiencies or until the compliance determination is confirmed, previously required at the Min-AL.*

Metric #9: Inspection frequency – Underwater – Higher risk bridges rev 5/1/17

NBIS Reference: 23 CFR 650.311 (b) – Underwater (UW) inspections

Criteria

- UW inspections are performed at regular intervals not to exceed (NTE) 60 months.

Population: Higher risk bridges requiring UW inspections for the entire state that are open to traffic, with inspection dates changed since previous year's NBI submission or are overdue.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All UW inspections are performed within the required NTE 60-month interval, unless documented unusual circumstances have caused a 1-month delay for any UW inspections.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 95% of UW inspections are performed within the required NTE 60 interval plus 1 month.
- 100% of UW inspections are performed within the required interval plus 4 months.
- Minor deficiencies exist in the documentation process for 1-month inspection delays, or not all delays are properly documented.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Generate MAR9 within 30 days of NBI data acceptance and review to resolve overdue UW inspections – notify the State of overdue inspections, track completion, and document result on MAR9.
- Review MAR9 Summary for indication of any new deficiencies.
- Assess based on MAR9 Snapshot and previous review results, and on the reviewer's knowledge and awareness.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Review MAR9 and resolve data to the extent necessary to assure that the compliance status shown is correct.
- If appropriate, perform a supplemental MAR9 analysis for current year UW inspections using additional data obtained from the State.
- If 1-month inspection delays exist, review procedures to ensure there is a process to document unusual circumstances and that the process is being followed.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #9: Commentary rev 5/1/17

General: The commentary for Metric 6 applies to this metric, except where noted.

Population: Risk classification for Metric 9 is based on substructure/culvert condition and scour vulnerability. Higher risk criteria for Metric 9:

- 92B = Y
- NBI Item 60 or 62 < 5 or
- Item 113 = 0, 1, 2, 3, 6, T or U

Bridges adhering to FHWA approved extended frequency criteria are assumed to be lower risk.

Background/changes for PY2018: *This metric was updated at the Min-AL to no longer require resolution of all possible deficiencies identified in the MAR, only resolution of inspections identified as overdue. The Int-AL was modified to require the resolution of all possible deficiencies or until the compliance determination is confirmed, previously required at the Min-AL.*

Metric #10: Inspection frequency – Fracture Critical Member rev 5/1/17

NBIS Reference: 23 CFR 650.311 (c) – Fracture critical member (FCM)

Criteria

- FCMs are inspected at regular intervals not to exceed (NTE) 24 months.

Population: Bridges that require FCM inspections for the entire State, are open to traffic, and whose FCM inspection dates have changed since the previous year's NBI submission or are overdue.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All FCM inspections are performed within the required NTE 24-month interval, unless documented unusual circumstances have caused a 1month delay for any FCM inspections.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 95% of FCM inspections are performed within the required NTE 24 interval plus 1 month.
- 100% of FCM inspections are performed within the required interval plus 4 months.
- Minor deficiencies exist in the documentation process for 1-month inspection delays, or not all delays are properly documented.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Generate MAR10 within 30 days of NBI data acceptance and review to resolve overdue bridge inspections – notify the State of overdue inspections, track completion, and document result on MAR10.
- Review MAR10 Summary for indication of any new deficiencies.
- Assess based on MAR10 Snapshot and previous review results, and on the reviewer's knowledge and awareness.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Review MAR10 and resolve data to the extent necessary to assure that the compliance status shown is correct.
- If appropriate, perform a supplemental MAR10 analysis for current year inspections using additional data obtained from the State.
- If 1-month inspection delays exist, review procedures to ensure there is a process to document unusual circumstances and that the process is being followed.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #10: Commentary rev 5/1/17

General: The commentary for Metric 6 applies to this metric, except where noted.

FCM inspections are different from Routine inspections, and although some bridges may be considered in both metrics, the assessment is of two different inspection types.

Population: Metric 10 is based on bridges identified as requiring a fracture critical member inspection. Criteria for Metric 10:

- Item 92A = Y

Background/changes for PY2018: *This metric was updated at the Min-AL to no longer require resolution of all possible deficiencies identified in the MAR, only resolution of inspections identified as overdue. The Int-AL was modified to require the resolution of all possible deficiencies or until the compliance determination is confirmed, previously required at the Min-AL.*

Metric #11: Inspection frequency – Frequency criteria rev 5/1/17

NBIS Reference: 23 CFR 650.311 (a)(2), (b)(2), (c)2, (d) – Frequency criteria

Criteria

Criteria is established to determine level of inspection, and frequency for all of the following inspection types where appropriate:

- Routine inspections – for less than 24-month intervals
- FCM inspections – for less than 24-month intervals
- Underwater inspections – for less than 60-month intervals
- Damage inspections
- In-depth inspections
- Special inspections

Population: Bridges meeting established criteria for the entire State, are open to traffic, and whose inspection dates have changed since the previous year's NBI submission or are overdue.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All level of inspection and frequency criteria are established.
- All bridges indicate the appropriate level of inspection and frequency in accordance with the established criteria.

Substantial Compliance (SC): All of the following must be met for SC:

- All level of inspection and frequency criteria are established.
- Records for less than all bridges indicate the appropriate level of inspection and frequency in accordance with the established criteria.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Review MAR11 Summary for indication of any new deficiencies.
- Assess based on previous review results, and the reviewer's knowledge and awareness.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Review established level of inspection and frequency criteria.
- Review MAR11 to resolve data to the extent necessary to assure that the compliance status shown is correct and to discuss any identified issues with the State.
- Obtain or generate a list of all bridges meeting State criteria, and review a random sample from the list to determine adherence to State criteria.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #11: Commentary rev 5/1/17

General: This metric ensures there is criteria established for triggering more frequent inspections, and that the criteria is followed.

Criteria: It is understood that a specific frequency is often not established for In-depth and Special inspections, and typically never for Damage inspections; however, criteria for level of inspections should be established for all types.

Compliance levels: If bridge records or MAR resolution indicates that some inspections are found that do not adhere to the established level and frequency criteria, the PM should be notified of the finding and the metric assessed as SC. The finding will not result in NC because there is no direct requirement in the NBIS for the State to follow its own criteria; however, since following it is implied, such a finding is not considered full compliance and therefore is considered SC.

Reasonable documentation for not following the established criteria is acceptable and should be counted as adhering to the criteria.

Assessment levels: For the Min-AL, review the MAR for indication of any new deficiencies, keeping in mind that many shown may reflect limitations in analyzing the NBI data. The MAR information at the Min-AL is for knowledge and awareness only, which should inform whether to perform further review at the Int-AL for either the current or the following review year, to further assess the extent of the issue.

Also for the Int-AL, obtain and review the criteria used by the State, and to the extent possible generate a list of bridges meeting that criteria. Ensure that all bridges are coded for the reduced frequency identified in the policy. The ability to generate a list may be limited to querying any NBI items that may be included in their criteria, which may not capture every aspect of the State's criteria. Alternatively, ask the State to generate the list, and clearly identify the criteria used to develop that list.

Metric Assessment Report (MAR): Generate the MAR using the NBIP MARGen tool available at the NBIP SharePoint site. The MAR is typically based on the most recent and previous April NBI submissions.

The MAR is based on NBI data, which has some known limitations for determining compliance. A few examples include border bridges where the other State has inspection responsibility, when the time frame for processing and submitting NBI data causes some inspection data to be omitted from the submittal, or situations when the bridge has been replaced or work has been performed that changes the inspection schedule.

Background/changes for PY2018: *The Int-AL was modified to bring into the metric an existing requirement to resolve all deficiencies identified in the MAR or until the compliance determination is confirmed.*

Metric #12: Inspection procedures – Quality Inspections rev 5/1/17

NBIS Reference: 23 CFR 650.313 (a) & (b) Inspection procedures – Quality inspections

Criteria

- Each bridge is inspected in accordance with the *AASHTO Manual for Bridge Evaluation (MBE)*, as measured by the following criteria:
  - condition codes are within generally acceptable tolerances,
  - all notable bridge deficiencies are identified, and
  - condition codes are supported by narrative that appropriately justifies and documents the component condition rating.
- A qualified team leader is at the bridge at all times during each initial, routine, in-depth, fracture critical member and underwater inspection.

Population: Bridges in the State or selected geographic/owner subset that are open to traffic, and have been inspected since January 1 of the previous calendar year.

Compliance Levels

Compliance (C): All of the following must be met for C:

- At least 90% of bridges reviewed meet the criteria for component condition ratings, documentation of deficiencies, and following of applicable MBE procedures.
- All bridges reviewed had a qualified team leader on site during all most recent inspection types.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 80% of bridges reviewed meet criteria for component condition ratings, documentation of deficiencies, and following of applicable MBE procedures.
- All bridges reviewed had a qualified team leader on site during all most recent inspection types.

Non-Compliance (NC): One or more SC criteria are not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Perform field reviews of bridges sampled at a LOC 80%, MOE 15% size or greater, to compare inspection reports for all appropriate inspection types with actual bridge conditions to evaluate:
  1) Accuracy of component condition codes;
  2) Use of MBE procedures;
  3) Adequacy of documentation and appropriate justification of component condition ratings;
  4) Indication that a qualified team leader was present at each applicable inspection, and qualified divers for underwater inspections.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Include field verification of one active Routine inspection to verify team leader presence and that MBE procedures are followed.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

General: Metric 12 assesses the quality of bridge inspections. For each sampled bridge, all applicable types of inspection are field reviewed to determine if the inspections:

- Were conducted by qualified team leaders,
- Were performed using proper procedures,
- Resulted in accurate condition codes,
- Resulted in fully documented deficiencies, and
- Included all appropriate inspection types.

Routine bridge inspections, and FCM and UW inspections when appropriate, are assessed. Complex inspection procedures where needed are also assessed. The most recent inspection report(s) for all types are compared to field conditions.

Inspected in accordance with the AASHTO MBE means that inspection processes and techniques described in the MBE Section 4 for Routine, FCM, and UW inspections are generally followed. Verifying the use of MBE procedures through field reviews is generally limited to looking for obvious discrepancies between documented procedures and field observations, such as indications that certain areas were not accessed or that the FCMs or elements requiring an UW were not accessed. Therefore, the primary means of assessing whether MBE procedures were followed, other than participation in the active inspection, is by review of inspection report documentation including photos for evidence that procedures were carried out.

Metric 22 should be assessed along with the Metric 12 field reviews. Metric 12 is focused on the four main condition codes resulting from inspections, the quality of the inspection documentation, and overall quality of the inspection, whereas Metric 22 assesses other NBI data items associated with the bridge record.

Field reviews are not complete and thorough bridge safety inspections. Rather, these reviews should make a reasonable assessment of the overall quality of the most recent inspection and verify, to the extent practical, the previous inspection findings and condition assessments for the accessible parts of the bridge.

If the inspection report identifies findings that cannot be confirmed, those findings should be assumed accurate. However, observed defects or deterioration that are not documented in the report may require further investigation, such as review of prior inspection reports and interviews, before considering the defect an inspection quality issue.

Field reviews should be coordinated with the State PM or other appropriate inspection staff. State or agency participation in the review is strongly encouraged, as this typically leads to a consensus of review findings, informative discussions, and insight into the inspection program. The expectation is that the field review is conducted with State personnel.

In the rare event the State or agency staff do not attend, make every effort to include another FHWA employee, for safety of the reviewer. Discuss with the Division leadership or BSE if someone cannot be found to accompany the reviewer.

Bridges requiring excessive effort or cost due to geography or inaccessibility need not be included in the field review subset.

Population: The population includes all bridges in the State or a geographic or owner subset (if selected by the reviewer) that have had Routine Inspections since January of the previous calendar year prior to the start of the review year. For example, for the PY18 review beginning in April 2017,

the review should only include those bridges having had Routine Inspections during or after January 2016. This will ensure that only recent inspections are reviewed, preventing review of the same structure in subsequent years and identification of older issues that may have since been corrected.

For the sample bridges, the most recent FCM, Underwater, Complex, and other types of inspections also must be included in the review, regardless of when performed (even if prior to January 2016).

Reviewing a subset can reduce the amount of travel required, but all subsets for the entire State must be covered in the 5-year review cycle. The plan for review by subsets must be documented each year under extent of review in the FSM.

Geographic subsets should include all owning agencies within that subset. Rotation of subsets around the State in less than 5 years may be advantageous, allowing flexibility to focus the remaining year(s) of the cycle on reassessment of certain areas or a statewide sample to gain an overall perspective.

Sampling: The minimum number and selection of the field review bridges is based on a statistical randomized sample, largely consistent with other metrics, and retains sampling flexibility for the reviewer. The sample is based on criteria determined to ensure selection of bridges with target risk factors, conditions, and other characteristics. The criteria used by the NBIP Sampling Tool to select the sample bridges and can be found on the NBIP SharePoint site.

The default sample size used by the Tool is Tier 1 (LOC 80%, MOE 15%), with the ability to select a Tier 2 (LOC 80%, MOE 10%) sample size. A larger than Tier 1 sample size may be selected for field review, but the PM must be notified of and understand the reasons for reviewing a larger size, and the larger size must be documented before the review in the 'Extent of Review' field in the FSM. A larger size other than Tier 2 will require manual selection of additional field bridges in the order from the random sample list.

For example, if desired, 20 bridges may be field-reviewed in order to remain consistent with past reviews. When using standard mathematical rounding, the effect of reviewing a Tier 1 sample size vs. 20 will affect the allowable number of inspections beyond the metric tolerances for each compliance level.

The Sampling Tool selects a target number of bridges for each of the Procedure metrics (Metrics 13, 14, 16-19, 21) being reviewed at the Int-AL, if available in the selected geographic area. The tool also selects a target number of bridges in poor, fair, and good condition and on the NHS before rounding out the sample with bridges of any type, condition, or on/off-system.

The random sample may be manually modified in the Sampling Tool after selection. Reasons for replacing a sample bridge with another include but are not limited to replacement, closure, or inaccessibility due to flooding or construction work. However, the next bridge listed in random sample list should be selected in place of the removed bridge. To obtain a different diversity of structure types or other factors, the criteria listed above for structural conditions and procedures metrics being assessed at the Int-AL must first be met. Discuss with the BSE any unique situations where further selection modification is desired. Document the justification for the selection changes in the FSM.

Compliance levels: *Generally acceptable tolerances* for condition assessments exist when the inspector determined NBI condition codes are within one value of the review team's. The team typically includes both FHWA and State staff.

Notable bridge deficiencies are those leading to NBI component ratings of 5 or less, or those requiring some kind of immediate action.

The metric is assessed on a 'per bridge' basis. If all factors are within tolerance as identified on the field review form, then the bridge is a positive data point toward compliance. Conversely, if one or more factors for the bridge are out of tolerance, then the bridge is a negative data point. If 17 of the 18 bridges are positive (or 94.4%), using standard mathematical rounding to 94%, the determination for this metric would be Compliant.

When more than one inspection type was completed, percentages for measuring compliance are still determined based on the number of bridges field reviewed. For example, one bridge may have current inspection reports for routine, FCM, and UW inspections. This package of three reports should be considered one data point. The result of the three inspections should yield one resulting superstructure condition code in the data submittal, and also in the routine inspection report if completed more recently than the fracture critical and underwater inspection reports. If the three reports are judged to have the condition codes (Items 58, 59, and 60, or 62) within acceptable tolerances, it would be a positive data point toward compliance. If 18 bridges identified for field review had 23 current NBIS inspection reports (5 are inspections other than routine), the denominator to use for the percentage calculation should be 18 (not 23). The same logic applies to assessing documentation of notable deficiencies in the three inspection reports.

Condition coding guidance is available in the comprehensive bridge inspection training course, in addition to the Coding Guide and the BIRM. Draw upon all FHWA guidance to determine the proper condition code, understanding the extent and severity of deterioration and effect on structural capacity that is intended for each level of condition. Consult the BSE if a disagreement in the field cannot be resolved.

Appropriate justification of determined ratings means the lower the value of the condition code, the amount of documentation increases to thoroughly describe its location, extent, and significance. While a condition code of 6 may normally warrant a fairly brief narrative, as the condition worsens more thorough documentation is required, which should include photos, sketches, measurements, etc., to fully document the identified deficiencies and support the assigned condition rating. Per the MBE, condition codes of 5 or less require appropriate documentation. If there is lack of documentation for a component rated 6 or greater, this is acceptable, though it is considered good practice to include an appropriate description for components in all conditions.

If findings from an UW or FCM inspection have resulted in a lowering of a condition code, the lowered code and the associated narrative should be reflected in the subsequent Routine inspection report.

If a compliance issue is found in one geographic subset, the issue should be applied to the State compliance determination and an appropriate PCA should be implemented. If in the following year a review is done in a different region yielding no issues, but the PCA for the previous year is not yet complete, the State is still considered to be in non-compliance until the PCA is complete and no other compliance issues have been found.

Assessment levels: Metric 12 assesses, in part, whether a qualified TL was present during the inspection, while team leader qualifications are assessed under Metric 3. Comparing the team leader designated on the inspection report to an approved list of team leaders provided by the program manager is sufficient evidence that a qualified team leader was present. If no qualified team leader as identified by the State is found to have been on site during one or more inspections, Metric 12 is NC, except for the following scenario. If the team leader present at the site is on the State's list of qualified team leaders, but it was found under Metric 3 that the team leader isn't actually qualified, this issue affects compliance for Metric 3 but not Metric 12. However, document the lack of a qualified team leader on site in Metric 12 and explain that the compliance was affected for Metric 3.

At the Min-AL, use the Sampling Tool to determine the field review bridges, which will produce a randomized list based on a predetermined set of factors and, if desired, based on the reviewer's selected (filtered) geographic region. The sample size at the Tier 1 level will likely be between 15 and 19 bridges, depending on the population of State bridges and the sub-population chosen for the geographic area under review. The reviewer should remove any bridges that have been dismantled or replaced, border bridges not under the State's responsibility, or are otherwise inappropriate for review, then use the tool to select the next one(s) on the randomized list. The reason for removal of any bridge from the original randomized list should be documented in the Extent of Review section of the FSM in SMART. Tier 2 or some other larger sample size should be considered in cases where a larger selection would better represent multiple Districts or owning agencies within the State or geographic area.

Assessing Metric 12 along with related Procedure metrics: When a related Procedure metric is being assessed at the Min-AL, regardless of the Metric 12 assessment level, the reviewer is not expected to compare conditions at the site with any bridge-specific procedures in the bridge file. Instead, focus on the overall quality of inspection(s) compared to the inspection report(s), accessibility of bridge members for inspection, and on the other aspects of Metric 12 such as accuracy of the condition codes, supporting narrative, and presence of a team leader. In this case, obvious procedure related inspection quality issues found during the field review, such as a bridge with a pier in deep water and no evidence of an UW inspection being performed on the pier, should be considered Metric 12 findings. However, any finding directly related to a bridge-specific procedure for any Min-AL Procedure metric should add to the reviewer's knowledge and awareness of issues related to that other metric, but should not directly affect the compliance measure for that metric. Discuss particular findings with the PM and document them in the FSM. For serious findings, complete an Int-AL review for the affected Procedure metric in the current or following review year.

When a related Procedure metric is being assessed at the Int-AL, the bridge-specific procedures are to be reviewed under that metric. If evidence is found in the field indicating the bridge-specific procedures were not followed, an inspection quality finding should be applied to Metric 12. On the other hand, if the bridge-specific procedures were followed, but the procedures are found inadequate for the particular bridge, a procedure finding should be applied to the Procedure metric.

Judgement should be applied in determining the effect of an inspection finding on either the Metric 12 or related Procedure metric's compliance measure, taking into account the severity and extent of the finding, the actual effect on inspection quality, and the importance of the specific procedure to inspection quality.

For example, when a bridge-specific procedure has all FCMs identified, but evidence in the inspection report or the field indicates some FCMs were not inspected within arm's reach, the issue should result in an inspection quality finding for Metric 12. However, if some FCMs were not

identified but evidence shows all FCMs were inspected within arm's reach, the issue would result in a bridge-specific procedure finding for Metric 16. If the FCMs were not identified and evidence shows that FCMs were not inspected within arm's reach, the finding should be applied to both Metrics 12 and 16. If the extent of the finding isn't clear, or if it's uncertain which metric(s) apply, discuss with the BSE.

If the most recent UW inspection report is several years old, any findings still apply toward the bridge assessment.

At the Int-AL for Metric 12, include participation in at least one active Routine inspection. Select the bridge(s) manually in consultation with the State, independent of the random sample bridges. For the active inspection(s), observe the inspection process and application of proper procedures. Add the bridge(s) to the random sample as a data point for assessment, but only review the bridge(s) for the Field Form items related to quality of inspection, following of procedures, and qualified team leader presence on the lower portion of the Form. Do not assess the condition ratings and narrative from the previous Routine inspection report, or the ratings and narrative generated from the current inspection. Although the condition ratings and supporting narratives aren't rated on the Field Form for the bridge(s), assess the bridge(s) as a data point with the other bridges for final compliance determination.

Background/ changes for PY 2018: *Revised this metric to make the selection of field bridges based on a random sample, to be more consistent with other metrics. The random sample is based on criteria built into the FHWA Sampling Tool, related to aspects determined to reflect higher risk, to ensure selection of bridges of certain types and in fair to poor condition.*

Metric #13: Inspection procedures – Load Rating rev 5/1/17

NBIS Reference: 23 CFR 650.313 (c) – Rate each bridge to its safe load-carrying capacity

Criteria

- Bridges are rated for their safe load carrying capacity in accordance with the *AASHTO Manual for Bridge Evaluation (MBE),* for all legal vehicles and State routine permit loads.

Population: All bridges in the State that are open to traffic.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All bridges have a NBI load rating determination.
- All sampled bridges have documentation in accordance with the MBE that supports the load rating determinations.

Substantial Compliance (SC): All of the following must be met for SC:

- 100% of higher risk bridges and at least 95% of lower risk bridges have an NBI load rating determination.
- At least 90% of sampled bridges sampled have documentation in accordance with the MBE that supports the load rating determinations.
- Ratings may have minor or isolated documentation deficiencies, but these do not adversely affect the accuracy of the rating.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Review MAR13 Summary for indication of any new compliance deficiencies.
- Assess based on previous review results, the status of any new compliance deficiencies, and the reviewer's knowledge and awareness of State load rating practices.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Review MAR13 and resolve load rating compliance deficiencies to the extent necessary to assure that the compliance status shown is correct, and discuss identified load rating data inconsistencies with the State.
- Randomly sample bridges identified in the NBI as having load rating determinations and review the load ratings to verify that load rating calculations or documented determinations exist, all legal vehicles were considered, and load ratings are consistent with current conditions.
- Include some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to compare actual bridge conditions with those identified in the load rating.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – conduct in accordance with national direction and guidelines.

Metric #13: Commentary rev 5/1/17

General: The NBIS requires all bridges to be rated for safe load capacity, including bridge length culverts.

Population: *Higher risk bridges* for the Load Rating metric are those bridges with:

- NBI condition ratings of 4 (Poor) or less for Superstructure (Item 59), Substructure (Item 60), or Culvert (Item 62)
- Item 70 <5
- NBI appraisal rating of 3 (Serious) or less for Structural Evaluation (Item 67)
- Bridges requiring load restriction (NBI Item 41 coded B, P or R),
- Bridges with temporary supports (NBI Item 41 coded D)
- Bridges with fracture critical members (FCM)

Lower risk bridges for this metric are those that are not classified as higher risk bridges.

Compliance levels: A load rating, as defined in the NBIS, is *the determination of the live load carrying capacity of a bridge using bridge plans and supplemented by information gathered from a field inspection.*

An *NBI load rating determination* means NBI Items 63 and 65 are not equal to 5 (no load rating analysis or evaluation performed).

The 100% and 95% thresholds in the first SC criteria are applied to higher and lower risk bridges, respectively, as analyzed by MAR using the entire State inventory, while the 90% threshold in the second SC criteria is applied to the file review sample, which is reviewed at the Int-AL. The difference in the thresholds reflects the different aspects of assessing inventory load rating data versus the review of a random sample of load rating files.

For SC, *minor or isolated documentation deficiencies* include calculations that are difficult to follow, missing data input; valid but unclear assumptions, etc.

Any NBI reporting deficiencies, including data not reported in the proper format (RF/HS20/HL93), or NBI data not matching the load ratings on file, should be considered for Metric 22.

Per the MBE, ratings should be accurate for current structural and traffic conditions, and material types.

Reasonable timeframes to accomplish a load rating should be acknowledged in assessing compliance. For example, consider a bridge that has recently been identified as needing a rating (or re-rating), but the rating has not yet been done; if the State established timeframe has not been exceeded, this bridge would not be considered as a rating deficiency.

The load rating should consider all legal vehicles when determining if posting is required or not. This can either be done on a per bridge basis, or by parametric analysis for groups of bridges. When the design load rating value does not envelope all legal loads, a rating value must be documented for each vehicle requiring posting.

Assessment levels: Assessment of this metric includes review of MAR for all assessment levels, but to a higher degree at the Int-AL than the Min-AL; it also includes review of a sampling of files, and field reviews at the Int-AL.

Metric #13: Commentary rev 5/1/17

The MAR includes all bridges for the metric population, and is based on the most recent and previous April NBI submissions.

The MAR has a *summary* tab and a data tab(s). The data tab(s) details inconsistencies, errors, or compliance deficiencies in the NBI load rating data. The results shown on the *summary* tab should be considered a preliminary assessment of compliance only. Investigation of the data issues, as indicated below, is required. Some issues may be data errors (a Metric 22 issue), while others may relate to the load rating (a Metric 13 issue).

At the Min-AL, the MAR summary tab is reviewed for knowledge and awareness. If new compliance deficiencies are identified that are not being corrected under a PCA, then the metric should be assessed at the Int-AL, preferably in the current review year, or at the latest in the next year, to determine the full extent of any issues related to the metric.

At the Int-AL, the compliance deficiencies identified on the summary and data tabs as red items must be resolved by:

1. Reviewing the data for inconsistencies and errors, resolving as appropriate.
2. Informing the State of any non-resolved compliance deficiencies, and the NC or SC determination based on MAR13.
3. Asking if the State concurs with the NC determination.
    a. If there is concurrence with NC, follow normal procedures for NC.
    b. If there is not concurrence with NC, ask for corrected NBI data or an explanation as to why the metric should not be considered NC. If necessary to achieve resolution, increase the sample size to the Tier 2 level or complete additional investigation at the InD-AL.

The final compliance snapshot on the MAR summary tab after resolution must match the compliance level assigned for the metric.

The data inconsistencies identified in the MAR as yellow items are also evaluated at the Int-AL. Review a few (at least 5 recommended) bridges of these bridges to determine if correction is necessary. Some data inconsistencies could be valid, while others may not be, leading to SC and a resulting Improvement Plan.

File review: At the Int-AL, select a random sample of bridges for file review. *Verify bridges have load rating calculations or that documented determinations exist* and ensure that the results are consistent with other bridge information contained in the file and in the NBI.

Verify load rating calculations, assumptions, and methodology to ensure consistency between calculations and the load rating summary information, suitability of rating vehicles, software program used, etc. Note load rating *assumptions* in the file and verify the actual conditions. Such assumptions include LRFR considerations for condition, significance of or changes to dead load, impact forces, and effectiveness of enforcement.

Evaluation of the load rating file and load rating *policies and procedures* requires familiarity with assigned rating policies (5 conditions in the 9/29/2011 HIBT memo), rating vehicles (including AASHTO's SHVs), and other MBE provisions.

An assigned rating is different than an engineering judgment rating as prescribed in the AASHTO Manual. Engineering judgment is allowed by the MBE in certain circumstances, primarily for concrete or masonry bridges with no plans.

The FHWA Resource Center or Headquarters load rating specialists are available to participate when conducting an Int-AL review.

Field reviews: At the Min-AL, the reviewer should compare field conditions, condition codes, inspection narrative, and design load with the overall load rating, checking only for obvious and substantial discrepancies between them. If a load rating issue is found for bridges field reviewed under Metric 12, it should add to the reviewer's knowledge and awareness for Metric 13. For example, if a load rating for a bridge being reviewed under Metric 12 does not seem to match field conditions, consider reviewing Metric 13 at the Int-AL sooner in the 5-year cycle than previously planned or reviewing at the Tier 2 level to further assess the extent of the issue.

At the Int-AL, the process for determining the number and selection of sample bridges from this metric for inclusion in the field review for Metrics 12 and 22 is covered in Metric 12, and is repeated in part here. The Sampling Tool will automatically select a target number of bridges (see selection criteria on the NBIP SharePoint site for current target number) required under this metric for the Metrics 12 and 22 field reviews, if available in the selected geographic area. If fewer bridges than the target are available, the reviewer is not expected to go outside of the geographic area to review additional bridges.

At the Int-AL for Metric 13 for bridges selected for both field and file review, any field findings can be applied directly to the compliance determination for Metric 13. Actual bridge conditions should be compared to the load rating assumptions, input criteria, etc., such as the percentage of section loss on steel beams.

Also at the Int-AL, evaluate the accuracy and compatibility of other related load rating NBI items listed below for all bridges sampled. If NBI data is inaccurate, this should not directly affect the compliance of Metric 13, since NBI data quality is assessed under Metric 22. Notify the State of any data quality errors, but the data should not directly impact the compliance determination of Metric 22. However, if a widespread data issue is suspected, consider (re)assessing Metric 22 at the Int-AL and including the load rating data item(s) in question.

Load rating NBI items relating to, or which could influence this rating include:

- Item 31 – Design Load
- Items 63-66 – Operating/Inventory Ratings and Methods
- Item 41 – Structure Open, Posted or Closed
- Item 70 – Bridge Posting
- Item 103 – Temporary Structure
- Item 106 – Year Reconstructed
- Item 108 – Wearing Surface

Metric Assessment Report (MAR): The MAR is generated using the NBIP MARGen tool available at the NBIP SharePoint site.

The MAR is based on NBI data, which has some known limitations for determining compliance. A few examples include border bridges where the other State has inspection responsibility, when the time frame for processing and submitting NBI data causes some inspection data to be omitted from the submittal, or situations when the bridge has been replaced or work has been performed that changes the inspection schedule.

Metric #13: Commentary rev 5/1/17

Background/ changes for PY 2018: *Metric revised to no longer require resolution of all possible deficiencies per the MAR at the Min-AL; several clarifications were made in the Commentary.*

Metric #14: Inspection procedures – Post or Restrict rev 5/1/17

NBIS Reference: 23 CFR 650.313 (c) Inspection procedures – Post or restrict bridges

Criteria

- Bridges are posted or restricted in accordance with the *AASHTO Manual for Bridge Evaluation (MBE)* or in accordance with State law, when the maximum unrestricted legal loads or State routine permit loads exceed that allowed under the operating rating or equivalent rating factor.
- Posting deficiencies are promptly resolved.

Population: All bridges in the State requiring posting or that are closed.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All bridges are properly posted or restricted.
- All identified posting/closing compliance deficiencies have been promptly resolved.

Substantial Compliance (SC): All of the following must be met for SC:

- All bridges are properly posted or restricted.
- Posting deficiencies have been promptly resolved, but no maximum timeframe for correction has been established or documented.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Review and notify the State of posting deficiencies identified in MAR14 within 30 days of notification from the NBI administrator that the data has been accepted; resolve all posting deficiencies identified in MAR14.
- Assess based on previous review results, the status of current posting deficiencies, and the reviewer's knowledge and awareness of State load posting practices.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Randomly sample bridges requiring posting and review the bridge files to verify that the documentation shows posting is properly implemented and corresponds to the load rating recommendation.
- Include some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify that posting signs exist and are appropriate for the current load rating and posting recommendations.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

Metric #14: Commentary rev 5/1/17

General: This metric assesses whether bridges are load posted or restricted when the maximum unrestricted legal loads or State routine permit loads exceed those allowed under the operating rating or equivalent rating factor.

Population: Criteria for Metric 14, bridges requiring posting:

- Item 41 = A and (Item 70 < 5 or Item 64 < 20 mT*) or
- Item 41 = B, D, E, K, P or R or
- Item 41 <> K and Item 64 < 2.7 mT*

* Note that the Sampling Tool and MAR generator require Item 64 to be in metric tons, regardless of how submitted. When Items 64 (and 66) are submitted as a rating factor to the NBI, they are converted to and stored as metric tons. When generating a NBI data file, Item 64 (and 66) are output in metric tons.

Compliance levels: *Promptly resolved* means resolving within the timeframe stipulated in the load posting procedures. The FHWA recommends resolution as soon as possible depending on urgency, up to 90 days if no timeframe has been established. The FHWA selected the default 90-day timeframe after careful consideration of current practice, the safety implications, and what can reasonably be accomplished. However, in cases where known existing loads significantly exceed the recommended posting limit, or the route is of significant importance (bus routes, emergency vehicle routes, etc.), FHWA recognizes that these routes must be posted much more quickly to ensure safety.

It is not possible to eliminate vandalism or impact damage; however, the owner should develop a process to quickly replace or repair such signs upon discovering the problem. For example, some States consider a missing posting sign a critical finding and have established an allowable timeframe to reinstall the sign. Similarly, once determined that a bridge must be restricted for loads, the new signs must be installed promptly. If the owner is able to install the missing, damaged, or new posting signs within the agreed upon timeframe, the deficiency is considered resolved, and a determination of C is warranted. If the owner has no established timeframe, but still promptly resolves the issue, a determination of substantial compliance is warranted. If the owner does not timely address the issue of posting deficiencies, this should be considered NC.

Consider substandard signs, such as those with the proper information but a non-standard font or sign material or not easily readable, to be SC.

Assessment levels: *Resolve all identified posting/closing compliance deficiencies* by following up on identified items and determining if they are just data errors that must be corrected, or if bridges still must be posted. Confirm the accuracy of the data, and resolve any compliance issue(s). If the bridge has since been posted within the established timeframes, this would be considered resolved. If any bridge must be posted and has not been by the established timeframes (or 90 days if no timeframe is established), this is considered NC. Address such situations promptly with the State, and communicate them to the Division Administrator and the Bridge Safety Engineer. Document the current status and eventual resolution of each of these situations in the MAR14, with a copy attached in SMART.

At the Min-AL for Metric 14, if a posting issue is found for bridges field reviewed under Metric 12, use this knowledge and awareness to consider another review of Metric 14 at the Int-AL in the current or following review year, to further assess the extent of the issue. Discuss particular findings with the State for prompt resolution.

At the Int-AL, the process for determining the number and selection of sample bridges from this metric for inclusion in the field review for Metrics 12 and 22 is covered in Metric 12, and is in part repeated

here. The Sampling Tool will automatically select a target number of bridges from this metric for the Metrics 12 and 22 field reviews if available in the selected geographic area (see selection criteria on the NBIP SharePoint site). If fewer than the target are available, the reviewer is not expected to go outside of the geographic area to review additional bridges.

At the Int-AL for Metric 14, for bridges selected for both field and file review, any field findings can be applied directly to the compliance determination for Metric 14.

Load posting NBI items are those related to or could influence this topic: Item 31 – Design Load; Items 63-66 – Operating/Inventory Ratings and Methods; Item 41 – Structure Open, Posted, or Closed; Item 70 – Bridge Posting; Item 103 – Temporary Structure. At the Int-ALs these items are reviewed during field reviews for compatibility between items and for accuracy. The reviewer should include these items as part of an Int-AL of Metric 22 when this level of assessment is undertaken for Metric 14.

In some cases, bridges on the Metric 14 sample that need posting are coded 'R' for Item 41—these are often parkway bridges with ample load capacity for the trucks allowed on the parkway. In these cases, if the operating rating meets or exceeds the force effects from all allowable truck loads on that route, and heavier trucks are restricted by some other method than load posting each bridge, then the code of 'R' is sufficient to indicate that the bridge is restricted and does not need to be individually posted.

Metric Assessment Report (MAR): The MAR includes all bridges for the metric population, based on the most recent and previous April NBI submissions.

The MAR has a *summary* tab and a data tab(s). The data tab shows the bridge-by-bridge posting status based on several evaluations using NBI Items 41, 64, 70, 103, and 59-60 or 62 in the most recent and the previous year's NBI submissions. It also has a *Bridge Compliance Status* indicator showing the overall posting status of the bridges. The *summary* tab summarizes the evaluation data on the data tab and provides an *Overall Compliance Snapshot* based on a summary of the *Bridge Compliance Status* indicator.

For all assessment levels, the *Bridge Compliance Status* of all bridges evaluated as *not properly posted or restricted* must be resolved. The data tab provides columns for manually overriding the evaluation result and for providing comments or explanations based on the review.

Posting/closing compliance deficiencies are those identified as red items in the MAR. (Note: These include the "safety related checks" of the NBI submission, but also incorporate more data checks).

MAR *data inconsistencies and errors* are those identified as yellow items in the report.

Background/changes for PY2018: *Clarifications were made to commentary.*

Metric #15: Inspection procedures – Bridge Files rev 5/1/17

NBIS Reference: 23 CFR 650.313 (d) – Prepare bridge files

Criteria

- Bridge files are prepared and significant bridge file components recorded as described in the AASHTO MBE.

Population: Bridges for the entire State that are open to traffic.

Compliance Levels

Compliance (C): All of the following must be met for C:
- All sampled bridges have files.
- All sampled files have the applicable significant components.

Substantial Compliance (SC): All of the following must be met for SC:
- All sampled bridges have files.
- At least 85% of sampled bridge files have the applicable significant components.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:
- Monitor PCA if in effect.
- Assess based on previous review results and the reviewer's knowledge and awareness of State's practices.

Intermediate Assessment (Int-AL): In addition to the Min-AL:
- Randomly sample bridges to verify that bridge files and significant bridge file components exist; if some components are only referenced, verify the components exist in the referenced location(s) and are readily available.

In-Depth Assessment (InD-AL): In-Depth Assessment (InD-AL): Perform one of the following:
- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines

Metric #15: Commentary rev 5/1/17

General: As outlined in Section 2 of the AASHTO Manual (MBE), the bridge file contains a wide range of information applicable to bridge inspection which may be located in more than one location. The list of *applicable significant bridge file components* for Metric 15, which is a subset of the larger list provided in the MBE is composed of:

- Inspection reports
- Waterway information – channel cross-sections, soundings, stream profiles
- Special inspection procedures or requirements
- Load rating documentation, including load testing results
- Posting documentation
- Critical findings and actions taken
- Scour assessment
- Scour Plan of Action (POA) (for scour critical bridges and those with unknown foundations) and documentation of post-event inspection or follow-up
- Inventory and evaluation data and collection/verification forms
- Significant correspondence

Per the NBIS, bridge files must also contain maintenance records.

Channel cross-sections must be included in the bridge file per section 4.8.7 of the AASHTO MBE. The FHWA interprets the MBE provision to apply to all bridges, including floorless culverts, spanning a waterway. Cross sections include vertical measurements from identified points on the upstream and downstream face(s) of the structure to the stream bottom or embankment at each abutment and at other substructure walls or piers at a minimum. A single cross section at one face may be appropriate for historically stable channels and embankments. Cross sections must be updated periodically so that a historical comparison is available in the file to help determine the extent of any scour, channel shifting, degradation, or aggradation of the stream. A frequency for obtaining and updating these measurements should be established, depending on an assessment of the bridge and stream characteristics, and documented in the bridge file. Evaluate the need for obtaining cross sections for pipes and box culverts that meet the definition of a bridge under the NBIS on a case-by-case basis.

Significant correspondence refers to correspondence and agreements regarding inspection responsibility, ownership, maintenance responsibilities with other agencies, or other issues that have an impact on the ability to ensure that thorough and timely inspections are completed.

For additional information on particular aspects or considerations relating to the significant file components, consult Section 2 of the AASHTO MBE.

Some significant components require retention of historical information, such as inspection reports, channel cross-section, etc. If the historical aspect of these components is found deficient, such as lack of past cross-section information, the remedy of this practice through an improvement plan or plan of corrective action will only change future documentation. Future year assessments should consider these recent improvements and their effectiveness of procedures moving forward in time in evaluating the adequacy of these components, and not require full histories that are unrecoverable. Another scenario is if files have been destroyed by a natural disaster, the previous files should be re-created to the extent possible from electronic or duplicate copies that may exist elsewhere, and from that time going forward the new file contents should be complete.

Metric #15: Commentary rev 5/1/17

Compliance levels: Percentages for determining metric compliance should be calculated by considering each bridge file as one data point. Each of the significant components listed above and relevant maintenance and inspection data are the minimum requirements. Those components that do not apply to that particular bridge do not affect compliance for that bridge. For example, a scour assessment is not necessary if the bridge is not over water; no posting documentation is necessary if calculated load capacities were sufficient; etc.

For another example, when reviewing a sample of 19 bridges at the Int-AL, 1 bridge file is missing a required scour assessment; a second is missing both the load rating calculations and the stream cross-sections for a scour critical bridge; and the remaining bridge files are complete. The compliance percentage would be calculated as 17/19, or 89.5%, yielding a substantial compliance determination for the metric.

Assessment levels: Most of the components of a bridge file should be in the same location; however, if there are items that are not included in the bridge file, the file should reference where the information is located. The bridge file can be electronic, hard-copy, or a combination of both, as determined by the State's policies. Bridge files, or parts thereof, might be located in district or region offices for agencies that have a de-centralized organizational structure. These files may be reviewed electronically, by requesting mailed copies, or by visiting the remote offices.

Background/ changes for PY 2018: *Minor editorial corrections made, and clarification on channel cross sections and relevant maintenance data.*

Metric #16: Inspection procedures – Fracture Critical Members rev 5/1/17

NBIS Reference: 23 CFR 650.313 (e) (1) – Bridges with fracture critical members (FCMs)

Criteria

- Bridges with FCMs have the following:
  - location of all FCMs identified
  - inspection frequency
  - inspection procedures
- FCMs are inspected according to those procedures.

Population: Bridges for the entire State with FCMs that are open to traffic.

Compliance Levels

Compliance (C): All of the following must be met for C:
- All sampled bridges with FCMs have documented inspection procedures.
- All sampled bridges with FCMs are inspected according to those procedures.

Substantial Compliance (SC): All of the following must be met for SC:
- All sampled bridges with FCMs have documented inspection procedures; the procedures may have minor or isolated deficiencies that do not adversely affect the effectiveness of the FCM inspections.
- All sampled bridges with FCMs are inspected according to those procedures.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:
- Monitor PCA if in effect.
- Assess based on previous review results and the reviewer's knowledge and awareness of State's FCM inspection practices.

Intermediate Assessment (Int-AL): In addition to the Min-AL:
- Randomly sample bridges to verify that sample FCM bridge files contain inspection procedures, and the FCM inspection report indicates the bridge was inspected according to those procedures.
- Include some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify documented procedures were followed.

In-Depth Assessment (InD-AL): Perform one of the following:
- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

General: FCMs must be inspected according to the documented inspection procedures for the bridge, which should contribute to thorough inspections yielding accurate condition assessments.

Risk factors to consider for inspection procedures include, but are not limited to:

- fatigue and fracture prone details
- problematic materials
- poor welding techniques
- potential out-of-plane distortion details
- previous cracking or repairs
- source of prior cracking
- cold service temperatures
- load posted
- superstructure condition code of 4 or less
- subject to overloads or impact damage
- older service life
- removal of debris
- high ADTT (either ADTT>5,000 or State defined criteria)

Knowledge of the source of prior cracking, such as load induced, distortion induced, constraint induced (pop-in fracture), or fabrication flaws (hydrogen, weld defect, etc.), can determine proper inspection procedures. Load induced is typically the most predictable, whereas the others are less predictable (with more inherent risk). The lowest anticipated service temperature is an important factor in determining susceptibility to cracking.

Bridges posted because of a controlling FCM, which may include deterioration, also warrant special attention. In general, evaluate the appropriateness of the prescribed procedures for any identified risk factors.

The non-redundant nature of FCMs, especially when coupled with risk factors, leads to a heightened concern for the performance of these members. By identifying these conditions or risk factors, the inspectors of FCMs can appropriately prepare for, and perform, a thorough inspection. Accordingly, the reviewer should, for those bridges selected from this metric for field review, look for the presence of risk factors at each site and evaluate whether the FCM inspection procedures and the inspection reports adequately address them.

Compliance levels: *Minor or isolated deficiencies* with FCM inspection procedures are those that could be improved to make the inspection more efficient or effective, or relate to better documentation of the report or the procedures. For example, ultrasonic inspection methods might be listed, but it is unclear which members will receive UT. However, the identification of FCMs, frequency of inspection, and knowing the risk factors present are all critical items, and deficiencies in these are not considered minor.

Assessment levels: Documented inspection procedures are those procedures required in the NBIS for specific types of more complex inspections, in this case for FCMs, to address those items that need to be communicated to the inspection team leader to ensure a successful inspection. These inspections must be planned and prepared for, identifying and accounting for each fracture critical member, needed access, inspection equipment, risk factors present (as detailed above), inspection methods and frequencies, and the required qualifications of inspecting personnel.

The AASHTO MBE, Section 4, has general considerations regarding inspection plans. An owner may have general overall inspection procedures in their bridge inspection manual which address common aspects of FCM inspections; however, each bridge with FCMs must have written inspection procedures specific to that bridge which address items unique to that bridge, if any. The prior inspection report is valuable to review for previous inspection findings, but often does not serve the

same purpose as the inspection procedures. The inspection report records what an inspector actually did, what was looked at, and what was found. Procedures lay out what should be done, looked at, etc. However, the required procedures may be incorporated into each report, often as an introductory section. This is an acceptable practice.

At the Min-AL for Metric 16, any State bridge-specific FCM procedures need not be assessed during the field reviews of any bridges under Metric 12 that may include FCMs. If an issue is found regarding a bridge-specific FCM inspection procedure for bridges field reviewed under Metric 12, it should add to the reviewer's knowledge and awareness toward Metric 16. Consider reviewing Metric 16 at the Int-AL in the current or following review year, to further assess the extent of the issue. Discuss particular findings with the State and document them in the FSM.

Conversely, at the Int-AL for Metric 16, for bridges selected for both field and file review, any field findings should be applied directly to the compliance determination for Metric 16.

For file review sampled bridges, evaluate the FCM inspection procedures for compatibility with the inspection reports and the bridge plans.

At the Int-AL, the process for determining the number and selection of sample bridges from this metric for inclusion in the field review for Metrics 12 and 22 is covered in Metric 12, and is repeated here in part. The Sampling Tool will automatically select a target number of bridges from this metric for the Metrics 12 and 22 field reviews if available in the selected geographic area (see selection criteria on the NBIP SharePoint site for field bridge selection). If fewer than the target are available, the reviewer is not expected to go outside of the geographic area to review additional bridges.

Background/ changes for PY 2018: *Clarifications to field review selection and other clarifications were made.*

Metric #17: Inspection procedures – Underwater rev 5/1/17

NBIS Reference: 23 CFR 650.313 (e)(2) – Bridges requiring underwater (UW) inspections

Criteria

- Bridges requiring UW inspection have the following:
  - location of all UW inspection elements identified
  - inspection frequency
  - inspection procedures
- UW elements are inspected according to those procedures.

Population: Bridges for the entire State requiring underwater inspection that are open to traffic.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All sampled bridges requiring UW inspection have documented inspection procedures.
- All sampled bridges requiring UW inspections are inspected according to those procedures.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 90% of sampled bridges requiring UW inspections have documented inspection procedures; procedures may have minor or isolated deficiencies, but the deficiencies do not adversely affect the effectiveness of the UW inspections.
- At least 90% of sampled bridges requiring UW inspections are inspected according to those procedures.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Assess based on previous review results and the reviewer's knowledge and awareness of State's UW inspection practices.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Randomly sample bridges to verify that files contain UW inspection procedures, and the UW inspection report shows that the bridge was inspected according to those procedures.
- Include some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify documented procedures were followed.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

Metric #17: Commentary rev 5/1/17

General: UW inspection must be performed according to the documented inspection procedures for the bridge, which should contribute to thorough inspections yielding accurate condition assessments.

Documented UW inspection procedures are those procedures required in the NBIS for specific types of more complex inspections, in this case for underwater elements, to address those items that must be communicated to the inspection team leader to ensure a successful inspection. These inspections must be planned and prepared for, taking into account identified underwater elements, physical scour countermeasures, needed access, inspection equipment, structural details, hydraulic features and characteristics, risk factors (as detailed below), inspection methods and frequencies, and the required qualifications of inspecting personnel.

Other items that may be addressed, if applicable, are: special contracting procedures prior to inspection (Coast Guard, etc.) and scheduling considerations (lake draw down, canal dry time, etc.). The AASHTO MBE, Section 4, gives general considerations regarding inspection plans.

An owner may have general overall inspection procedures in the bridge inspection manual that address common aspects of underwater inspections; however, each bridge with elements requiring underwater inspection must have written inspection procedures specific to each bridge that address items unique to that bridge. The prior inspection report is valuable to review for previous inspection findings, but most often does not serve the same purpose as the inspection procedures. The inspection report records what an inspector actually did, what was looked at, and what was found. Procedures lay out what should be done, looked at, etc. However, the required procedures may be incorporated into the report, often as an introductory section. This is an acceptable practice.

This metric considers the risks of bridges which cross over waterways. The development of good inspection procedures and concerted attention to follow those procedures will mitigate most of those risks. In addition, the risk of scour for scour critical bridges or bridges with unknown foundations is mitigated by development and implementation of a scour plan of action (POA) for each bridge.

Compliance levels: Specific risk factors include waterway features that may promote scour and undermining of substructure elements, such as, but not limited to:

- rapid stream flows
- significant debris accumulation
- constricted waterway openings
- soft or unstable streambeds
- meandering channels

Water conditions that may affect the inspection, such as black water or rapid stream flows, should be identified and accounted for in the inspection methods. The procedures should identify water environment and structural systems or materials that may accelerate deterioration of the bridge elements. These factors include highly corrosive water, unprotected steel members, timber piling in the presence of teredos or limnoria, etc. By identifying these conditions, the underwater inspectors can appropriately prepare for and perform a thorough inspection.

Metric #17: Commentary rev 5/1/17

For bridges sampled for field and/or file review, look for any evidence of risk factors or unique circumstances or conditions at each site by reviewing the inspection report, plans, etc., and comparing them with the inspection procedures. The field review should verify underwater inspection access requirements, if possible.

Assessment levels: At the Min-AL for Metric 17, any State bridge-specific procedures need not be assessed during the field reviews of any bridges under Metric 12, which may include bridges requiring underwater inspections. If a specific underwater inspection procedure issue is found for bridges field reviewed under Metric 12, it should add to the reviewer's knowledge and awareness toward Metric 17, and consider reviewing Metric 17 at the Int-AL in the current or following review year, to further assess the extent of the issue. Discuss particular findings with the State and document them in the FSM.

Conversely, at the Int-AL for Metric 17, for bridges selected by the sampling tool for both field and file review, any field findings should be applied directly to the compliance determination for Metric 17.

At the Int-AL, the process for determining the number and selection of sample bridges from this metric for inclusion in the field review for Metrics 12 and 22 is covered in Metric 12, and is in part repeated here. The Sampling Tool will automatically select a target number of bridges from this metric for the Metrics 12 and 22 field reviews, if available in the selected geographic area (see selection criteria on the NBIP SharePoint site for field bridge selection). If fewer than the target are available, the reviewer is not expected to go outside of the geographic area to review additional bridges.

Background/ changes for PY 2018: *No substantial changes were made to this metric. Minor clarifications and editorial corrections were made.*

Metric #18: Inspection procedures – Scour rev 5/1/17

NBIS Reference: 23 CFR 650.313 (e), (e3) Bridges that are scour critical

Criteria

- Bridges over water have a documented evaluation of scour vulnerability.
- Bridges that are scour critical have a scour plan of action (POA) prepared to monitor known and potential deficiencies and to address scour critical findings.
- Bridges that are scour critical are monitored in accordance with the POA.

Population: Bridges for the entire State that are over water and open to traffic.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All bridges over water have a scour evaluation as indicated by NBI scour coding.
- All sampled bridges have a documented scour evaluation assessing scour vulnerability.
- All sampled bridges that are scour critical or with unknown foundations have a scour POA.
- All sampled bridges subject to a triggering event are monitored in accordance with the POA.

Substantial Compliance (SC): All of the following must be met for SC:

- All bridges over water have a scour evaluation as indicated by NBI scour coding.
- All sampled bridges over water have a documented scour evaluation assessing scour vulnerability, but some evaluations may have minor or isolated deficiencies that do not adversely affect the assessment.
- All sampled bridges that are scour critical or with unknown foundations have a POA, but some may have minor or isolated deficiencies that do not adversely affect the POA effectiveness.
- All sampled scour critical bridges subject to a triggering event are monitored in accordance with the POA, but minor deficiencies in documentation of monitoring may exist.

Non-Compliance (NC): One or more SC criteria are not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Review MAR18 Summary and resolve previously identified unevaluated bridges.
- Assess based on previous review results, the status of any new compliance deficiencies, and from the reviewer's knowledge and awareness of the State's processes and practices.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Randomly sample bridges to review files to verify that scour evaluations are documented, consistent with bridge conditions, and properly assess scour vulnerability.
- From the random sample, verify that POAs are developed and documented for those that are scour critical or have unknown foundations.
- Include some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify validity of scour evaluations.
- If a triggering event has occurred to a sampled bridge during the 2-year period prior to the year of assessment, review file and conduct interviews as necessary to verify that monitoring was executed in accordance with POA.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

Metric #18: Commentary rev 5/1/17

Population: Metric 18 criteria:

Criteria for bridges requiring scour evaluation:

- Item 42B = 5, 6, 7, 8, 9 (all bridges over waterways) or
- Item 113 < or > N

Criteria for bridges requiring a scour POA:

- Item 113 < 4 (scour critical bridges) or
- Item 113 = U (bridges over water with unknown foundations)

Compliance levels: POA *deficiencies* leading to a SC determination could be either lack of adequate documentation or ineffective monitoring. Lack of documentation could include inadequate or outdated information for emergency contacts, scour information, etc.

A *documented scour evaluation* should be a report with calculations, a documented assessment, or documented screening process explaining how the Item 113 value was determined. This evaluation should be available for every bridge over water.

Ineffective monitoring could involve situations where monitoring thresholds are poorly chosen or not clearly identified, or there was some confusion on what to monitor for or in what priority.

SC instances represent minor or isolated situations. POAs with major or significant shortcomings that render them useless for mitigating scour risks are NC findings.

Assessment levels: *Previously identified unevaluated bridges* in the MAR are those which have been coded as 6/ T/ null in Item 113 – Scour Critical Bridges. The resolution of these items at the Min-AL is to verify that those bridges have been evaluated for scour.

At the Min-AL for Metric 18, any State bridge-specific procedures need not be assessed during the field reviews of any bridges under Metric 12, which may include bridges that are scour critical and require a POA. If a specific issue related to Metric 18 is found for bridges field reviewed under Metric 12, it should add to the reviewer's knowledge and awareness of compliance toward Metric 18, and consider reviewing Metric 18 at the Int-AL in the current or following review year, to further assess the extent of the issue. Discuss particular findings with the State and document them in the FSM.

Conversely, at the Int-AL for Metric 18, for bridges selected for both field and file review, any field findings should be applied directly to the compliance determination for Metric 18.

At the Int-AL, the process for determining the number and selection of sample bridges from this metric for inclusion in the field review for Metrics 12 and 22 is covered in Metric 12, and is repeated here in part. The Sampling Tool will automatically select a target number of bridges from this metric for the Metrics 12 and 22 field reviews if available in the selected geographic area (see selection criteria on the NBIP SharePoint site for field bridge selection). If fewer than the target are available, the reviewer is not expected to go outside of the geographic area to review additional bridges.

At the Int-AL, the field review of the sampled bridges should verify scour vulnerability coding compared to actual conditions, in addition to the other aspects of field review conducted under Metric 12 and 22. Also, for bridges requiring a scour POA, evaluate conditions on site to determine compatibility to the actions required in the plan. If a scour 'triggering event' has occurred within the

2-year period prior to the year of assessment (2 full calendar years prior), then determine if the POA was followed through record review, and through interview if the records are inconclusive.

Metric Assessment Report (MAR): The MAR includes all bridges over waterways for the metric population, based on the most recent and previous April NBI submissions.

The MAR has a summary tab and a data tab. The data tab shows the status of each bridge based on NBI Item 113 in the most recent and the previous year's NBI submissions. It also indicates whether a POA is required (if the bridge is scour critical or has an unknown foundation).

For all assessment levels, the status of all bridges listed as *not evaluated* (NBI Item 113 code = '6' or blank), identified as red items, must be resolved. The data tab provides columns for overriding the result and for providing comments or explanations based on the review.

For newly constructed or acquired bridges, a scour evaluation may be completed up to 1 year after acquisition.

Background/ changes for PY 2018: *The population for this metric now applies to all bridges over water when assessing completion of scour evaluations. Previous assessment at the Int-AL only applied to bridges evaluated as scour critical, not yet evaluated, or having unknown foundations. The Min-AL no longer requires verification of POAs for scour critical bridges.*

Metric #19: Inspection procedures – Complex Bridges rev 5/1/17

NBIS Reference: 23 CFR 650.313 (f) – Complex bridges

Criteria

- Complex bridges have the following identified:
  - specialized inspection procedures
  - additional inspector experience and training
- Complex bridges are inspected according to the procedures.

Population: Bridges for the entire State that are complex bridge types that are open to traffic.

Compliance Levels

Compliance (C): All of the following must be met for C:

- All sampled complex bridges have specialized documented inspection procedures, and have any required additional inspector training and experience identified.
- All sampled complex bridges are inspected according to the specialized procedures, and inspectors of those bridges have the identified additional training and experience.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 90% of sampled complex bridges have specialized documented inspection procedures, and have any required additional inspector training and experience identified.
- At least 90% of sampled complex bridges are inspected according to the specialized procedures, and inspectors have the identified additional training and experience.

Non-Compliance (NC): One or more SC criteria not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Assess based on previous review results and the reviewer's knowledge and awareness of complex bridge inspection procedures.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Randomly sample bridge files to verify that bridges have documented specialized inspection procedures, and that any additional inspector training and experience has been identified and met.
- Review sample bridge reports to verify that documented procedures were followed.
- Include some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify documented procedures were followed.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

General: *Complex features* found in complex bridges include, but are not limited to:

- suspension cables
- stay cables
- anchorages of cables and post-tensioning
- electrical systems
- mechanical systems
- operational systems and controls
- other unusual characteristics which may include:
  - floating bridge components
  - materials with known problems
  - special seismic features

Features may be considered complex due to design, constructability, and/or inspectability issues.

Complex bridges must be inspected according to the written inspection procedures for the bridge and by inspectors with the additional training and experience specified. This should result in thorough inspections yielding accurate condition assessments.

Specific risk factors include, but are not limited to:

- complex structural response
- difficult to access
- specialized inspection equipment needs
- high ADT & ADTT
- low redundancy
- history of past problems

By identifying these conditions or risk factors in the inspection procedures, the complex bridge inspectors can appropriately prepare for and perform a thorough inspection.

Population: Complex bridges are defined in the NBIS as movable, suspension, cable stayed, and other bridges with unusual characteristics. Criteria for Metric 19:

- Item 43B = 13, 14, 15, 16, or 17

States have the flexibility to define additional bridges considered complex because of unusual characteristics. If additional bridge types are considered complex, include them in the population.

Compliance levels: Acceptable *specialized documented inspection procedures* are required in the NBIS for specific types of more complex inspections, including for complex bridges. Such procedures address items that must be communicated to the inspection team leader to ensure a successful inspection. These inspections must be planned and prepared for, taking into account identified complex features (detailed above), risk factors (detailed above), inspection methods and frequencies, and the required qualifications of inspecting personnel. The AASHTO MBE, Section 4, discusses general considerations regarding inspection plans.

An owner may include general inspection procedures in the bridge inspection manual that address common aspects of inspecting particular features; however, each complex bridge with unique elements requiring special inspection must have specific written inspection procedures. These procedures must identify which features have unusual characteristics and detail how to inspect them. The prior inspection report is valuable to review for previous inspection findings, but most often does not serve the same purpose as the inspection procedures. The inspection report records what an inspector actually did, what was looked at, and what was found. Procedures lay out what should be done, looked at, etc. However, the required procedures may be incorporated into the report, often as an introductory section. This is an acceptable practice.

Metric #19: Commentary rev 5/1/17

Assessment levels: At the Min-AL for Metric 19, any State bridge-specific procedures need not be assessed during the field reviews of any bridges under Metric 12, which may include bridges requiring underwater inspections. If a specific issue related to Metric 19 is found for bridges field reviewed under Metric 12, it should add to the reviewer's knowledge and awareness toward Metric 19, and consider reviewing M19 at the Int-AL in the current or following review year, to further assess the extent of the issue. Discuss particular findings with the State and document them in the FSM.

Conversely, at the Int-AL for Metric 19, for bridges selected for both field and file review, any field findings should be applied directly to the compliance determination for Metric 19.

At the Int-AL, the process for determining the number and selection of sample bridges from this metric for inclusion in the field review for Metrics 12 and 22 is covered in Metric 12, and is repeated here in part. The Sampling Tool will automatically select a target number of bridges from this metric for the Metrics 12 and 22 field reviews if available in the selected geographic area (see selection criteria on the NBIP SharePoint site for field bridge selection). If fewer bridges than the target are available, the reviewer is not expected to go outside of the geographic area to review additional bridges.

For file reviews, evaluate the inspection procedures for compatibility with the inspection reports and the bridge plans.

The field reviews should verify the complex bridge designation, in addition to the other aspects of field review conducted under Metric 12 and 22.

For those bridges selected from this metric for field review, the reviewer should look for any evidence of risk factors or unique circumstances or conditions at each site. Then evaluate whether the inspection procedures and inspection reports adequately address them.

Background/ changes for PY 2018: *No substantial changes were made to this metric. Minor clarifications and editorial corrections were made.*

Metric #20: Inspection procedures – QC/QA rev 5/1/17

NBIS Reference: 23 CFR 650.313 (g) – QC/QA

Criteria

- Systematic quality control (QC) and quality assurance (QA) procedures are used to maintain a high degree of accuracy and consistency in the inspection program.
- QC/QA procedures include periodic field review of inspection teams, periodic refresher training requirements, and independent review of inspection reports and computations.

Population: None (or as determined to be appropriate by the reviewer).

Compliance Levels

Compliance (C): All of the following must be met for C:

- QC/QA procedures are established, documented, implemented, and effective.
- QC/QA procedures include periodic field review of inspection teams, periodic refresher training requirements, and independent review of inspection reports and computations.

Substantial Compliance (SC): All of the following must be met for SC:

- QC/QA procedures are established, implemented, and effective, but minor aspects of the procedures are not documented or are not being performed.
- QC/QA procedures include periodic field review of inspection teams, periodic refresher training requirements, and independent review of inspection reports and computations.

Non-Compliance (NC): One or more SC criteria are not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Assess based on previous review results and the reviewer's knowledge and awareness of QC/QA procedures.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Review written procedures to verify that the key components of the QC/QA procedures meet the requirements of the NBIS.
- Verify that a process exists to document the bridges that have received QC or QA.
- Review documentation of QA reviews for number of reviews, types of reviews and findings; verify that any measurable review requirements have been achieved.
- Assess whether the procedures are effective in improving program accuracy and consistency, by determining if actions resulting from the QA findings are being taken.
- Perform interviews of personnel responsible for QC and/or QA reviews to determine or verify procedures are used.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

Metric #20: Commentary rev 5/1/17

General: This metric evaluates if the QC/QA process meets the intent of the NBIS, verifies that the reviews are performed, and ensures that review results are used to maintain a high degree of accuracy and consistency in the inspection program.

FHWA's recommended QC/QA framework can be found at http://www.fhwa.dot.gov/bridge/nbis/nbisframework.cfm.

Criteria: *Computations* include but are not limited to load rating and scour evaluation calculations.

Review of Inspection Reports should also include review of the NBI data associated with the inspection.

Population: A population was not defined for this metric. There are many different methods and requirements by which Agencies perform QC/QA review of inspections, load ratings, NBI data, and other computations.

However, if the established QC/QA process lends itself to random sampling, the reviewer may use the NBIP assessment sampling criteria to review the various aspects of QC/QA process.

Compliance levels: *Implemented* QC/QA procedures infers that the procedures are enacted and used.

When evaluating this metric, consider if repetitive errors are found during the review of Metrics 12, 13, 18, and 22, as this may be an indication that the QC/QA procedures are ineffective.

If minor aspects of the QC/QA process are not being performed, but the overall effectiveness is not impacted, this would be considered SC. An example of *minor aspects* would be cases where a QC/QA check was performed, but documentation of the check is missing.

Assessment levels: The Min-AL is based upon the reviewer's knowledge and awareness the agencies QC/QA program and if the procedures are being followed.

Key components include periodic field review of inspection teams, periodic bridge inspection refresher training for program managers and team leaders, and independent review of inspection reports, NBI data, and computations.

At the Int-AL, review documented procedures for performing QC/QA of inspections, NBI data, and calculations to verify that the procedures include all NBIS required components.

Verify that established criterion exists for refresher training as part of this metric. Evaluate adherence to the established criteria by the program manager and team leaders as part of Metrics 2 and 3, respectively.

The QC/QA procedures should include a process to document and confirm that QC/QA procedures are being followed.

Verify that the information from the QC/QA process is used to maintain a high degree of accuracy and consistency in the inspection program. For example, if the review process finds a common coding error on several QA reviews, verify that the corrective action is disseminated (quarterly meetings, refresher training, memos, etc.) to all inspection teams.

Metric #20: Commentary rev 5/1/17

In addition to the QC/QA of owner's activities, verify that the procedures address the QC/QA of consultants and/or other agencies that perform inspections or calculations.

Interview personnel responsible for QC and/or QA to determine their level of understanding of the QC/QA process and if it is effective at maintaining a high degree of accuracy and consistency in the inspection program. At a minimum, one person should be interviewed, but this number can vary based upon the size of the program.

Background/ changes for PY 2018: *No substantial changes were made to this metric. Minor clarifications and editorial corrections were made.*

Metric #21: Inspection procedures – Critical Findings rev 5/1/17

NBIS Reference: 23 CFR 650.313 (h) – Follow-up on critical findings

Criteria

- A procedure is established to assure that critical findings, as defined in 650.305, are addressed in a timely manner.
- FHWA is periodically notified of the actions taken to resolve or monitor critical findings.

Population: All bridges identified by State criteria as having an active critical finding at the time of the last assessment, and any critical findings identified since the last assessment.

Compliance Levels

Compliance (C): All of the following must be met for C:

- A documented procedure has been established and implemented to assure critical findings are addressed in a timely manner.
- All critical findings are addressed and documented in accordance with the procedure.
- The period for notifying the FHWA of actions taken is established and followed.

Substantial Compliance (SC): All of the following must be met for SC:

- A documented State procedure has been established and implemented to assure critical findings are addressed, but timeframes for addressing critical findings are not clearly defined.
- All critical findings are addressed in accordance with the procedure; isolated instances exist where documentation of actions taken is incomplete.
- The period for FHWA notification of actions taken is established; FHWA was notified of critical findings in all but a few isolated instances, and was notified within the established period in all but a few isolated instances.

Non-Compliance (NC): One or more SC criteria are not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Monitor the periodic notifications to confirm that critical findings are being addressed.
- Verify the status of any critical findings during field reviews of bridges for Metrics 12 and 22.
- Assess based on previous review results and the reviewer's knowledge and awareness of the State's process for addressing critical findings.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Verify that the established critical finding procedure meets the requirements of the NBIS.
- Randomly sample bridges and review the bridge files to ensure that actions taken and documentation were in accordance with the established procedure, and that proper notifications of critical findings were provided.
- Include some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify that findings were addressed according to procedures.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

Population: The bridges identified for the Metric 21 population are taken from the State's periodic reporting of critical findings to FHWA. This reporting includes critical findings that occurred on bridges owned by State, local, and other agencies.

Identify the reported bridges in the Sampling Tool to create a population for Metric 21 prior to developing the field review sites. Additionally, when the NBI data is loaded into the Tool, include in the Metric 21 population bridges with a condition rating for Items 59-60 or 62 that are less than or equal to 2 (Critical).

Active critical findings are those in which the owner has not taken or completed action to address public safety including closure, repair, or replacement of the bridge.

Compliance levels: *Timely* for this metric is established in the State's procedure for addressing critical findings.

Addressed means that the owner has taken actions to protect public safety including closure, repair or replacement of the bridge.

The critical finding procedure must identify the permissible timeframe from when a critical finding is identified to when the structural or safety concern is addressed. If the procedure does not identify timeframes for addressing critical findings, this should be considered SC.

At the Substantial Compliance level, there may be isolated instances where the critical finding has been properly addressed but the actions taken are not documented. This may include missing documentation for completed work or failure to close out the critical finding after work is completed.

The maximum suggested interval for periodic *FHWA notification* is 3 months.

In an isolated instance where a critical finding was not reported to the FHWA pursuant to the policy, this is considered SC.

Assessment levels: At both the Min and Int-AL, the Sampling Tool will automatically select a target number of bridges with CFs in the sample for Metrics 12 and 22 field reviews if they exist in the selected geographic area. See selection criteria on the NBIP SharePoint site for field bridge selection. If fewer than the target number are available, the reviewer is not expected to go outside of the geographic area to review additional bridges. At both assessment levels, verify the status of any additional bridges with CFs that may also have been selected in the field review sample.

Verify the status of the critical finding to identify whether the actions proposed for the critical finding have been completed such as closure, repair, or replacement of the bridge.

At the Min-AL, monitor the periodic notifications from the State to verify that critical findings are addressed. Verify throughout the year when the notification is received. If a critical finding is not being addressed in timely manner, work to address the critical finding and consider reviewing this metric at the Int-AL in the current or following review year, to further assess the extent of the issue.

At the Int-AL, review files to check that critical findings have adequate *documentation* to track the status of the actions proposed and whether they were completed. If a bridge in the random sample is included based only on having a condition rating ≤ 2, determine whether the bridge should have qualified under the State criteria as a critical finding. If so, notification should have been provided to FHWA and the reviewer should determine if this is an isolated occurrence or an indication of a more widespread issue.

Metric #21: Commentary rev 5/1/17

When performing the review for this metric, consider how critical findings are monitored for bridges owned by local agencies.

If a critical finding for a bridge does not meet the intent of the NBIS regulation, it can be removed from the population.

Background for PY 2018: *This metric has been revised to include a check for critical findings that may have not been reported to FHWA, and also to perform field visits of critical finding bridges selected by the sampling tool.*

Metric #22: Inventory – Prepare and Maintain rev 5/1/17

NBIS Reference: 23 CFR 650.315 (a) – Prepare and maintain an inventory

Criteria

- An inventory of all bridges subject to the NBIS is prepared and maintained.
- Data collected is in accordance with that required for the Structure Inventory and Appraisal (SI&A) sheet.
- Data is recorded according to FHWA procedures and available for collection by FHWA as requested.

Population: Bridges for the entire State or selected geographic/owner subset that are open to traffic, and have been inspected since January 1 of the previous calendar year.

Compliance Levels

Compliance (C): All of the following must be met for C:

- At least 95% of the sampled bridge inventory items reviewed are within the acceptable tolerances.
- FHWA data checks did not identify any bridges with data errors.

Substantial Compliance (SC): All of the following must be met for SC:

- At least 90% of the sampled bridge inventory items reviewed are within the acceptable tolerances.
- No errors are identified in the Persistent Error Report, all other errors identified in the other FHWA Data Checks are resolved within 90 days.

Non-Compliance (NC): One or more SC criteria are not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Perform field reviews for a LOC of 80%, MOE of 15% sample of bridges or greater to verify NBI SI&A items with information in the bridge file and actual field conditions for the SI&A items identified on the Field Review Form. Resolve the safety related checks and persistent error reports generated during the NBI submittal process.
- Note NBI data errors found during review of other metrics when resolving MARs and other data, for knowledge and awareness.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Verify NBI SI&A items with information in the bridge file and actual field conditions for an additional SI&A item group available when generating the Field Review Form, selected based on the reviewer's knowledge and awareness of the program.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with national direction and guidelines.

Metric #22: Commentary rev 5/1/17

General: Metric 22 assesses the quality of NBI data and should be assessed along with the Metric 12 field reviews. Review and compare the data to the actual site conditions observed by the reviewer during the field reviews. Metric 12 in part focuses on the four main condition codes and supporting narrative resulting from the inspection (intentionally excluded from this metric), whereas this metric assesses other NBI data items associated with the bridge record.

All the NBI data should be as accurate as possible, so even if a small number of errors are found, they can be corrected.

Acceptable Tolerance is the allowable variance for an NBI item as identified in the NBIP Field Review Form. These tolerances were developed for the NBIP assessment process based upon safety, access limitations, and time constraints during the field review and must be used to assess compliance.

FHWA Data Checks are processed during the annual NBI submittal and sent to the Division and State by the National Bridge and Tunnel Inventory Engineer in the Office of Bridge Technology. *FHWA Data Checks** are as follows:

1. *National Bridge Inventory File Check* – Report generated by FHWA to identify errors when NBI data is submitted.
2. *Safety Related Checks* related to bridge closure – Report generated by FHWA to identify safety related issues. Report criteria:
    a. Item 64 < 2.7 metric tons; item 41 = A, B, P, or R; and item 103 is blank; and
    b. Any bridge with item 59 and/or item 60 coded < 2; item 41 = A, B, D, P, or R; and item 103 is blank.
3. *Persistent Error Report* – Report generated by FHWA to check for repeat errors over a 3-year period.

* Some identified errors in these reports are situations which are not covered in the current Coding Guide (for example, side hill viaducts), or are bridges with low operating ratings values in which the force effects of all State legal and routine permits are less than the calculated rating. Do not count such instances as data errors. If this situation occurs, document the reason for each bridge; this will also help in future year's reviews.

The *Safety Related Checks* related to physical posting (Item 64 between 2.7 and 19.9 mT or Item 41 = 'B') are assessed under Metric 14.

If necessary, update the NBI data for the subsequent annual NBI submittal.

Population: The number and selection of the field review bridges is based on a statistical random sample, consistent with other metrics. The sample is based on criteria built into the Sampling Tool to ensure selection of bridges with diverse conditions, and other characteristics. Please refer to Metric 12 commentary for a full explanation for field review bridge selection. Some is repeated here for emphasis.

Reviewing a geographic subset can reduce the amount of travel required, but all subsets for the entire State must be covered in the 5-year review cycle. The plan for review by subsets must be documented each year under extent of review in the FSM.

Geographic subsets should include all owning agencies within that subset. Rotation of subsets around the State in less than 5 years may be advantageous, allowing flexibility to focus the remaining

year(s) of the cycle on reassessment of certain areas or a statewide sample to gain an overall perspective.

If an issue of non-compliance is found in one geographic region or other subset, apply the issue to the State compliance determination, and implement an appropriate PCA. If in the following year a review is done in a different region yielding no issues, but the PCA for the previous year is not yet complete, the State is still considered to be in conditional compliance until the PCA is complete and no other compliance issues have been found.

As with other metrics, when a PCA is complete, an Int-AL review should be completed, either on the same region that had the compliance issue, for the entire State, or for some other geographic region, as long as the original region with the issue is included in the current region.

Compliance levels: When calculating the percentage of items which are within tolerance as identified in the NBIP Field Review Form, divide the total number of items properly coded by total number of items reviewed.

The following example is for a minimum level field review on 20 bridges, 15 items per bridge, of which 5 bridges are on the NHS:

NHS Bridges
15 items per bridge x 5 bridges = 75 items

Non-NHS Bridges
13 items per bridge x 15 bridges = 195 items

Percentage of items within tolerance
Total items reviewed = 75 + 195 = 270 items
10 items exceeded allowable tolerances
270 total items - 10 items exceeding tolerance = 260 item coded within tolerance
260/270 *100 = 96% coded within tolerance

In this example, if the items exceeding the allowable tolerance were isolated instances and these items were corrected, this would be considered C. If any of the miscoded items is a systematic problem that obviously occurs beyond the field reviewed bridges, such as when one data item is incorrect for most or all 20 bridges, correct the underlying issue and the data for all bridges before a determination of C can be assigned. Until all the items are correct, the appropriate compliance determination is SC.

Data errors found during review of the other metrics represent the quality of the NBI data. When a significant number of data errors are found, for example in resolving the MARs, these errors are not a direct compliance issue for Metric 22, but consider review of such items under an Int-AL in the current or following year.

Assessment levels: The NBIP Field Review Checklist identifies which items must be reviewed at the Min-AL for each field reviewed bridge. Each year the items will be rotated, and the current items will be on the most recent NBIP Field Review Checklist on SharePoint.

Metric #22: Commentary rev 5/1/17

At the Int-AL, in addition to the items identified at the Min-AL, review items from an additional SI&A Item category as identified on the NBIP Field Review Checklist.

During the field review of each bridge, verify that the NBI data reported to FHWA is properly coded and reflects conditions in the field. If an item cannot be verified in the field, compare NBI data with available information in the bridge inspection reports, plans, and other records. An example of an item that may be difficult to verify in the field is *Year Built*.

Regardless of the assessment level, review the *Persistent Error Report* generated during the NBI submittal process. Errors in this report must be resolved within 30 Days of receipt of the NBI data acceptance from FHWA HQ.

***Background/ changes for PY 2018**: Revised this metric to make the selection of field bridges based on a random sample, to be more consistent with other metrics. Data items to be reviewed will now be rotated each year.*

Metric #23: Inventory – Timely Updating of Data rev 5/1/17

NBIS Reference: 23 CFR 650.315 (a), (b), (c) & (d) – Updating data in the inventory

Criteria

- Structure Inventory and Appraisal (SI&A) data is submitted to the FHWA NBI as requested using FHWA established procedures.
- SI&A data is entered in the State's inventory within 90 days of the date for State owned bridges and within 180 days of the date for all other bridges for the following events:
  - routine, in-depth, fracture critical member, underwater, damage and special inspections
  - existing bridge modifications that alter previously recorded data and for new bridges
  - load restriction or closure status

Population: Bridges in the entire State.

Compliance Levels

Compliance (C): All of the following must be met for C:

- SI&A data is submitted to the FHWA NBI by the requested date with no errors preventing FHWA acceptance of the data.
- State has a process to verify SI&A data is updated in the State inventory within 90/180 days.
- SI&A data reviewed is updated in the State inventory within 90/180 days after inspection, modification, or change in load restriction.

Substantial Compliance (SC): All of the following must be met for SC:

- SI&A data is submitted to the FHWA NBI within 10 work days of the requested date; errors preventing acceptance are resolved within 15 work days after notification by FHWA.
- State does not have a process to verify SI&A data is updated in the State inventory within 90/180 days.
- At least 90% of SI&A data reviewed is updated in the State inventory within 90/180 days.

Non-Compliance (NC): One or more SC criteria are not met.

Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).

Assessment Levels (AL)

Minimum Assessment (Min-AL): Perform all of the following:

- Monitor PCA if in effect.
- Verify SI&A data was submitted to the FHWA NBI and verify any issues identified were resolved in the specified timeframe.
- Assess based on previous review results and reviewer's knowledge and awareness of State's program.

Intermediate Assessment (Int-AL): In addition to the Min-AL:

- Assess how State is able to determine if bridge SI&A data is updated in the 90/180 day timeframes through interview or review of procedures.
- Randomly sample bridges using Int-AL criteria to verify bridge SI&A data is updated in the 90/180 day timeframes.

In-Depth Assessment (InD-AL): Perform one of the following:

- Division InD-AL – In addition to the Int-AL, develop guidelines for review, with concurrence from BSE, and conduct in accordance with guidelines.
- National InD-AL – Conduct in accordance with established national direction and guidelines.

Metric #23: Commentary rev 5/1/17

General: The 90/180 day requirement for updating SI&A data refers to data entered into the State inventory. Updated SI&A data should be available in a central location for submittal to FHWA upon request. The 90/180 day timeframe starts at the completion of the specific activity (inspection, load rating, etc.). Local agencies must submit the SI&A data changes to the State within 180 days of the completion of the activity.

Population: To refine the scope of review of the updates to the NBI, review bridges for the entire State that are open to traffic, and have been inspected since January 1 of the previous calendar year, for all inspection types, bridge modification types, and capacity status.

Compliance levels: If SI&A data is submitted to the FHWA NBI beyond the requested date but within 10 work days of the requested date, this is considered SC. Further, if errors in the data prevent FHWA from accepting that data, but those errors are resolved within 15 work days after FHWA notifies the State of those errors, this is also considered SC. Track the submittal and re-submittal dates from the State to determine if this timeline is met.

If bridge records or State policy/procedures do not have a process to verify that SI&A data is updated in the State inventory within 90/180 days, notify the PM of the finding in writing, and assess the metric as SC.

At the Int-AL, for the random sample, the metric is assessed on a 'per bridge' basis. If all SI&A data for the bridge is updated in the 90/180 day timeframes, then the bridge is a positive data point toward compliance. Conversely, if one or more SI&A data items for the bridge are not updated in the 90/180 day timeframes, then the bridge is a negative data point.

Assessment levels: As identified in the Annual Call for Update of the National Bridge Inventory memorandum, a State should run the error check on UPACS and address any errors prior to submittal of the data. Alternatively, an internet version of this error check, *NBI Submittal File Check*, is available on FHWA's Website at http://www.fhwa.dot.gov\bridge\nbi.htm.

If an unusual circumstance arises and the State requests a time extension beyond the identified submittal date, the Division must coordinate with the NBI Engineer in the FHWA Office of Bridges and Structures to determine if a time extension is acceptable and to establish a revised submittal date.

Compliance with the 90/180 day timeframes – at the Int-AL, *assess how State is able to determine if bridge SI&A data is updated in the 90/180 day timeframes* by determining if the State has the ability to verify that data is being updated into the State inventory within 90/180 days of inspection, modification, or changes in load restrictions. Verify this by interviewing the person responsible for managing the data or reviewing the relevant procedures.

Background/ changes for PY 2018: *This metric has been updated to assess whether the SI&A data is submitted to the FHWA NBI in a timely manner through a random sample, instead of assessing the data from those bridges found as overdue in the frequency metrics.*