



U.S. Department
of Transportation

**Federal Highway
Administration**

HIBS-30

NBIPOT

NBIS Oversight Program

Metrics for the Oversight of the National Bridge Inspection Program



April 1, 2013



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National Bridge Inspection Program Metrics

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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
Assessment Reporting Tool (FHWA NBIP tool).....	ART
Bridge Safety Engineer (FHWA).....	BSE
Continuing Education Unit.....	CEU
Division Bridge staff reviewer	reviewer
Federal Highway Administration.....	FHWA
FHWA Headquarters Bridge Office.....	HIBT
FHWA Information Systems.....	UPACS
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 # ART 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

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: None.

Compliance Levels

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

- The organization is 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 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 documented organizational roles and responsibilities and delegation procedures, as applicable, exist.
- 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): In addition to the Int-AL:

- Conduct additional interviews to fully determine the overall effectiveness of the organization.

General: The purpose of this metric is to determine 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.

Compliance levels: *Safety issues* are those related to bridge closure, posting, critical findings, and overdue inspections. For C, the *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, a careful evaluation should be done to determine whether or not those non-compliance issues stem from deficiencies in the organizational structure itself. If so, then a finding of SC or NC as appropriate should be made for this metric.

One example of issues related to an organizational structure deficiency is where inspection staff is not aware of key components of organizational roles and responsibilities, resulting in inconsistencies in application of QA procedures. In this case the metric should be considered SC.

Another example is when a PM is assigned the responsibility for the NBIS, but with limited authority to ensure delegated agency compliance 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 should be considered NC due to the safety implications.

Assessment levels: At the Int-AL and InD-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.

Background/ changes for PY 2014: *Changes have been made to clarify the relationship of Metric #1 to the other 22 metrics, and to add the assessment of the State's established authority over delegated agencies.*

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.

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

- The Program Manager (PM) is either a registered professional engineer or has ten-years of bridge inspection experience.
- The PM has successfully completed FHWA approved comprehensive bridge inspection training.
- The PM has completed 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:

- 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 the reviewer's knowledge and awareness of the PM's qualifications.

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

- Verify qualifications of Program Manager through interview of PM or PM's direct supervisor(s).

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Review PM's qualification documentation.

General: The purpose of this metric is to evaluate the qualifications of the designated State PM, not any others 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 *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 would affect the compliance determination for Metric 1 but not Metric 2.

Background/ changes for PY 2014: *No substantial changes were made to this metric. The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.*

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

Criteria	<p>Each Team Leader (TL) must have at least one of the following qualifications:</p> <ul style="list-style-type: none"> • 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. <p>In addition to the above qualifications, TLs must have the following training:</p> <ul style="list-style-type: none"> • Successful completion of FHWA approved comprehensive bridge inspection training. • Completion of periodic bridge inspection refresher training according to State policy.
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Population: All TLs inspecting those bridges from January 1 of the calendar year prior to the beginning of the review year.

Compliance Levels	<p>Compliance (C): All of the following must be met for C:</p> <ul style="list-style-type: none"> • All team leaders have the required qualifications and have successfully completed FHWA approved comprehensive bridge inspection training. • All TLs have completed periodic bridge inspection refresher training according to State policy. <p>Substantial Compliance (SC): All of the following must be met for SC:</p> <ul style="list-style-type: none"> • All TLs have the required qualifications and have successfully completed FHWA approved comprehensive bridge inspection training. • One or more TLs have not completed periodic bridge inspection refresher training according to State policy. <p>Non-Compliance (NC): One or more SC criteria not met.</p> <p>Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).</p>
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Assessment Levels (AL)	<p>Minimum Assessment (Min-AL): Perform all of the following:</p> <ul style="list-style-type: none"> • Monitor PCA if in effect. • Assess based on previous review results, and the reviewer’s knowledge and awareness of process for monitoring TL qualifications. <p>Intermediate Assessment (Int-AL): In addition to the Min-AL:</p> <ul style="list-style-type: none"> • Randomly sample TLs using Intermediate sampling criteria to review qualifications, including dates of comprehensive and refresher training. • Interview the PM or supervisors to verify qualifications when documentation of qualifications is inconclusive. <p>In-Depth Assessment (InD-AL): In addition to the Int-AL:</p> <ul style="list-style-type: none"> • Randomly sample TLs using in-depth sampling criteria. • Interview some of the sampled team leaders directly as necessary to verify qualifications.
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General: This metric verifies that all team leaders listed for inspections during the time period defined are qualified. Metric #12 then verifies that team leaders are on site during each bridge inspection, and that the team leaders noted in the inspection reports reviewed are indeed from this list developed for Metric #3.

Population: This metric applies to 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 PY14 review that starts 4/1/13, include all TLs that have inspected since 1/1/12). This is to minimize overlap from one review year to the next.

Compliance levels: Refresher training is to 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 had refresher training in accordance with State policy, this is to be considered SC, notwithstanding other findings. If a TL has never had refresher training and none is planned, this is also to be considered SC for this metric, and should be further assessed under Metric 20. This is because section 650.313(g) Inspection Procedures, QC/QA, requires periodic refresher training, but it is not specifically required under the NBIS qualifications section 650.309 Qualifications of personnel.

Assessment levels: For the Int-AL and InD-AL, the following procedure is to be used for reviewing Team leader qualifications:

1. If a list of all TLs can be provided, review qualifications for all TLs on the list unless the number is greater than 19; in that case, randomly choose 19 from the list.
2. If no list can be provided, 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.

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, additional review effort should be directed at 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 for compliance determination of Metric 1, not Metric 3.

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 seven-years of the current year. 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. Request for transcripts can be sent to NHIRegistrar@dot.gov.

At the InD-AL, one way of achieving more thorough verification is to verify professional engineer licensing through the State's PE board website.

Background/ changes for PY 2014: A process was developed to review qualifications of current team leaders if there is no comprehensive list available.

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.

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

Criteria

The individual charged with overall responsibility for load rating bridges, the Load Rating Engineer (LRE), 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.

Substantial Compliance (SC): NA

Non-Compliance (NC): C 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 the LRE qualifications.

Intermediate Assessment (Int-AL): Verify qualifications of the LRE through interview of LRE or supervisor(s), or by review of documentation.

In-Depth Assessment (InD-AL): Verify qualifications of the LRE through both interview and review of documentation.

General: The Load Rating Engineer may or may not 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 ratings of all bridges in the State ultimately resides with the LRE.

The words *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. In addition, the intent is that any individual who provides the necessary engineering judgment for individual load rating determinations, and who reviews and approves the load rating results be a professional engineer.

Compliance levels: If the LRE is qualified but there are issues relating to lack of overall effectiveness, this would affect the compliance determination for Metric 1 but not Metric 4.

Assessment levels: At the Int-AL, verify qualifications of the LRE through interview of LRE or supervisor(s), or by review of documentation, whichever method is preferred by the reviewer. At the InD-AL, complete both.

Background/ changes for PY 2014: *No substantial changes were made to this metric. The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.*

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

Underwater bridge inspection divers are qualified by having 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 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 divers have successfully completed FHWA approved comprehensive bridge inspection training or FHWA approved underwater bridge inspection diver training.

Substantial Compliance (SC): NA

Non-Compliance (NC): C 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 process for monitoring underwater bridge inspection diver qualifications.

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

- Randomly sample divers using intermediate sampling criteria to review documentation of successful completion of required training.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Interview divers to verify successful completion of required training.

General: The purpose of this metric is to assess the qualifications of all underwater bridge inspection divers, including the team leader if participating as a diver in the underwater diving activity. The purpose is not to assess all requirements of the team leader; this is done in Metric #3.

Metric #12 verifies that team leaders are onsite during each bridge inspection observed in field reviews, and that the team leaders noted in the inspection reports reviewed are indeed from this list developed for 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.

The intent is that any diver solely responsible for inspection of any element has 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 C. Additional divers providing support roles only, such as ‘tender’ divers, are not required to have completed the training.

Assessment levels: For the Int-AL and InD-AL, the following procedure is to be used for reviewing diver qualifications:

1. If a list of all divers can be provided, review qualifications for all divers on the list unless the number is greater than 19; in that case, randomly choose 19 from the list.
2. If no list can be provided, refer to the sampling tool’s list of sampled bridges for Metric 17. From this sample, in the order of the random numbers already generated, obtain the names of the divers for each UW inspection until a sample of 19 unique divers is obtained.

Because the NBIS does not require a “list” of team leaders and/or underwater bridge inspection divers, the lack of a list does not affect the compliance status for Metric 5. However, in such situations, additional review effort should be directed at 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 for compliance determination of Metric 1, not 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 seven-years of the current year. 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. Request for transcripts can be sent to NHIRegistrar@dot.gov.

Background/ changes for PY 2014: *No substantial changes were made to this metric. The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.*

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.
- Lower risk bridges are defined for this metric as those with superstructure and substructure, or culvert, condition ratings of fair or better, and not requiring load restriction.

Population: Lower risk bridges for the entire State or selected geographic/owner subset that are open to traffic, and whose inspection dates have changed since the previous year's NBI submission or whose inspections 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 sampled 1-month delayed bridge inspections are documented for unusual circumstances.

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 one-month, as applicable.
- 100% of bridges are inspected within the required interval plus four-months.
- All bridges with extended inspections conform to FHWA approved 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 the following if PCA in effect:

- Monitor the PCA.
- Review Metric 6 ART Report (MAR6) to resolve all overdue inspections.

Otherwise, perform all of the following:

- Review MAR6 to resolve all overdue inspections and other issues indicated on the MAR6's Summary tab (see commentary).
- Where a SC snapshot is indicated in the MAR6 and all bridges are inspected within a 25- or 49-month interval, as applicable, perform first bullet under Int-AL below.
- Review current list of bridges approved for extended interval, as applicable.
- Consider supplemental analysis using current data as described in the Int-AL where changes in procedures have occurred.

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

- Randomly sample bridges with inspections at 25- and 49-month intervals using Intermediate criteria and review for documentation of unusual circumstances.
- If appropriate after review of the MAR6, perform supplemental frequency interval analysis using current data for recent inspections obtained from the State.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges with inspections at 25 and 49-month intervals using In-depth sampling criteria.

Population: The population 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 – those that were due prior to the NBI submission date but did not have a new inspection date submitted. The analysis includes the 90/180 day NBIS allowance for entering data and an additional 30 days for compiling of the submittal.

Risk classification is based on the bridge's super/substructure condition and required load restrictions, determined using NBI Items 41, 63, 64, and 70. Using these items will help identify posted bridges that do not require load restriction, and therefore are lower risk. All bridges meeting approved extended interval NTE 48-month criteria are considered lower risk. Criteria used:

Metric #6 – Lower risk bridges criteria: (NBI Item 59 and 60, or 62) >4 and either (NBI Item 70 $=5$ and Item 63 $\neq 5$) or (Item 63 $=5$ and Item 70 $=5$ and Item 41 $= A, D, \text{ or } E$)

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

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 used in the summary of the MAR6 are numerical representations of the compliance level thresholds.

For Compliance (C), while all bridges are expected to meet the meet the NTE 24-/48-month interval, the summary uses 85% for that count, and 100% for 25-/49-months. This allows 15% to have been inspected 1-month late without further analysis and still be assessed as C if there is a process in place to document late inspections for unusual circumstances. However, if the 85% NTE 24-/48-months is not met, a random sample of those bridges inspected in the 25th/49th month should be used to determine if unusual circumstances are documented. If all sampled bridges are documented, then the metric can be assessed as C.

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 the 25th/49th month. Such circumstances need to be documented. The thresholds also allow for flexibility so that structures previously inspected earlier than scheduled can get back on the original schedule.

An assessment of C can also be made if there are intervals that exceed the 25th/49th month and prior approval has been provided by FHWA.

For an assessment of Substantial Compliance (SC), the thresholds allow up to 10% of inspections to have been done after the 25th/49th month but 100% must be done by the 28th/52nd month. If these thresholds are exceeded as shown in the MAR6 snapshot, further review of the data as described below may be necessary.

Also note that for SC, a 50% threshold is included in the MAR6 for the NTE 24-/48-month interval. The intent of this threshold is to convey an expectation that at least half of inspections should be done 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: Regardless of planned assessment level, the review of this metric begins at the Minimum level with the MAR6 (described below). The MAR6 must be reviewed and, at a minimum, the overdue inspections identified must be resolved. See below for additional MAR6 review details.

For the Int-AL and InD-AL, random sampling of 25-/49-month interval inspections is required. This sampling is done to make sure that unusual circumstances leading to late inspections are documented.

Where warranted, the review can include obtaining the most recent inspection data from the State and performing a supplemental interval analysis. Such analysis should be done after consultation with the State and if there is a reasonable chance that current inspections will reveal a higher level of compliance. Include the most recent and previous inspections, previous frequency, other data as needed; cover at least 6 consecutive months or 25% of the population being reviewed. BSE assistance is available if such an analysis is needed.

Metric 6 ART Report (MAR6): Accessed from within ART, the MAR6 includes all bridges for the metric population, and is intended to be based on the most recent and previous April NBI submissions. The MAR6 can also be run from the UPACS NBI reports page in Staffnet.

Depending on the summary result, the review may require detailed examination and resolution or overriding of the data. The MAR6 is based on NBI data, which has some known limitations for determining compliance. A few of examples are border bridges where the other State has inspection responsibility, where the timing of submitting NBI data has missed an inspection, or the bridge has been replaced or work has been performed that changes the inspection schedule.

The interval and overdue status of individual bridges can be viewed on the data tab. Based on review, the status of a bridge can be overridden using the appropriate code. This will usually be the result of the examples mentioned above. The snapshot on the summary tab will automatically update with the override codes.

The data tab includes generated random numbers that can be used to develop the 25th/49th month random sample.

Background/ changes for PY 2014: *No substantial changes were made to this metric. The metric has been reformatted for improved clarity.*

Background/ changes for 2012: *This metric is revised to assess routine inspection intervals for lower risk bridges. Extended routine inspection interval bridges (2011 Metric #7) are considered lower risk and are included in this metric. Routine inspection intervals for higher risk bridges are assessed under revised Metric #7. These revisions allow for a simpler assessment process by combining similar risk inspections, and will allow a greater focus on higher risk bridges (Metric #7).*

Review of the establishment of criteria to determine level and frequency for bridges that require inspection at less than 24-month intervals have been moved to Metric #11. Review of inspection dates to verify that bridge records match the data recorded in the NBI has been moved from this metric to Metric #22. Inspection quality (i.e. does the inspection meet acceptable routine inspection procedures as described in the MBE) is assessed under Metric #12 instead of this metric.



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

Criteria

- Routine inspections are performed at regular intervals not to exceed (NTE) 24-months.
- Higher risk bridges are defined for this metric as those with a superstructure or substructure, or culvert, condition rating of poor or worse, or require load restriction.

Population: Higher risk bridges for the entire State or selected geographic/owner subset that are open to traffic and whose inspection dates have changed since the previous year’s NBI submission or whose inspections 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.
- All sampled 1-month delayed bridge inspections are documented for unusual circumstances.

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 one-month.
- 100% of bridges are inspected within the required interval plus four-months.

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 the following if PCA in effect:

- Monitor PCA.
- Review Metric 7 ART Report (MAR7) to resolve all overdue inspections.

Otherwise, perform all of the following:

- Review MAR7 to resolve all overdue inspections and other issues indicated on the MAR7’s Summary tab (see commentary).
- Where a SC snapshot is indicated in the MAR7 and all bridges are inspected within a 25-month interval, perform first bullet under Int-AL below.
- Consider supplemental analysis using current data as described in the Int-AL where changes in procedures have occurred.

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

- Randomly sample bridges with inspections at 25-month intervals using Intermediate sampling criteria and review for documentation of unusual circumstances.
- If appropriate after review of the MAR7, perform supplemental frequency interval analysis using current data for recent inspections obtained from the State.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges with inspections at 25-month intervals using In-depth sampling criteria.

Population: The population 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 – those that were due prior to the NBI submission date but did not have a new inspection date submitted. The analysis includes the 90/180 day NBIS allowance for entering data and an additional 30 days for compiling of the submittal.

Risk classification is based on the bridge's super/substructure condition and required load restrictions, determined using NBI Items 41, 63, 64, 70, and 113. Using these items will help eliminate posted bridges that do not actually require load restriction, and therefore are lower risk. Criteria used:

Metric #7 – Higher risk bridges criteria: (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, or U)

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

Compliance levels: Compliance levels are based on several cumulative thresholds, which allow factoring in unusual circumstances that can make the completion of inspections within the required month impractical or inefficient. The percentages used in the summary of the MAR7 are numerical representations of the compliance level thresholds.

For Compliance (C), while all bridges are expected to meet the meet the NTE 24-month interval, the summary uses 95% for that count, and 100% for 25-months. This allows 5% to have been inspected one-month late without further analysis and still be assessed as C if there is a process in place to document late inspections for unusual circumstances. However, if the 95% threshold is not met, a random sample of those bridges inspected in the 25th month should be used to determine if unusual circumstances are documented. If all sampled bridges are documented, then the metric can be assessed as C.

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 the 25th month. Such circumstances need to be documented. The thresholds also allow for flexibility so that structures previously inspected earlier than scheduled can get back on the original schedule.

An assessment of C can also be made if there are intervals that exceed the 25th month and prior approval has been provided by FHWA.

For an assessment of Substantial Compliance (SC), the thresholds allow up to 5% of inspections to have been done after the 25th month but 100% must be done by the 28th month. If these thresholds are exceeded as shown in the MAR7 snapshot, further review of the data as described below may be necessary.

Also note that for SC, a 50% threshold is included in the MAR7 for the NTE 24-month interval. The intent of this threshold is to convey an expectation that at least half of inspections should be done 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: Regardless of planned AL, the review of this metric begins at the Min-AL with the MAR7 (described below). The MAR7 must be reviewed and, at a minimum, the overdue inspections identified must be resolved. See below for additional MAR7 review details.

For the Int-AL and InD-ALs, random sampling of 25-month interval inspections is required. This sampling is done to make sure that unusual circumstances leading to late inspections are documented.

Where warranted, the review can include obtaining the most recent inspection data from the State and performing a supplemental interval analysis. Such analysis should be done after consultation with the State and if there is a reasonable chance that current inspections will reveal a higher level of compliance. Include the most recent and previous inspections, previous frequency, other data as needed; cover at least 6 consecutive months or 25% of the population being reviewed. BSE assistance is available if such an analysis is needed.

Metric 7 ART Report (MAR7): Accessed from within ART, the MAR7 includes all bridges for the metric population, and is intended to be based on the most recent and previous April NBI submissions. The MAR7 can also be run from the UPACS NBI reports page in Staffnet.

Depending on the summary result, the review may require detailed examination and resolution or overriding of the data. The MAR7 is based on NBI data, which has some known limitations for determining compliance. A few of examples are border bridges where the other State has inspection responsibility, where the timing of submitting NBI data has missed an inspection, or the bridge has been replaced or work has been performed that changes the inspection schedule.

The interval and overdue status of individual bridges can be viewed on the data tab. The status of a bridge can be overridden using the appropriate code. This will usually be the result of the examples mentioned above. The snapshot on the summary tab will automatically update with the override codes.

The data tab includes generated random numbers that can be used to develop the 25th month random sample.

Background/ changes for PY 2014: *This metric was updated to include scour critical bridges as higher risk. The metric has been reformatted for improved clarity.*

Background/ changes for 2012: *This metric is revised to assess routine inspection intervals for higher risk bridges. Extended routine inspection interval bridges (2011 Metric #7) are considered lower risk and are included in Metric #6. These revisions allow for a simpler assessment process by combining similar risk inspections, and will allow a greater focus on higher risk bridges.*

Review of the establishment of criteria to determine level and frequency for bridges that require inspection at less than 24-month intervals have been moved to Metric #11. Review of inspection dates to verify that bridge records match the data recorded in the NBI has been moved from this metric to Metric #22. Inspection quality (i.e. does the inspection meet acceptable routine inspection procedures as described in the MBE) is assessed under Metric #12 instead of this metric.



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

Criteria

- UW inspections are performed at regular intervals not to exceed (NTE) 60-months, or NTE 72-months when adhering to FHWA approved UW criteria.
- Lower risk bridges are defined for this metric as those with a substructure or culvert condition rating of fair or better, and evaluated as not scour critical.

Population: Lower risk bridges for the entire state or selected geographic/owner subset that require UW inspections, are open to traffic, and whose UW inspection dates have changed since the previous year's NBI submission or whose UW inspections 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 sampled 1-month delayed UW inspections are documented for unusual circumstances.

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

- At least 90% of UW inspections are performed within the required NTE 60- or 72-month interval plus one-month, as applicable.
- 100% of UW inspections are performed within the required interval plus four-months.
- All bridges with extended UW inspections conform to FHWA approved 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 the following if PCA in effect:

- Monitor PCA.
- Review Metric 8 ART Report (MAR8) to resolve all overdue UW inspections.

Otherwise, perform all of the following:

- Review MAR8 to resolve all overdue UW inspections and other issues indicated on the MAR8's Summary tab (see commentary).
- Where a SC snapshot is indicated in the MAR8 and all bridges are inspected within a 61- or 73-month interval, as applicable, perform first bullet under Int-AL below.
- Review current list of bridges approved for extended interval, as applicable.
- Consider supplemental analysis using current data as described in the Int-AL where changes in procedures have occurred.

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

- Randomly sample bridges with UW inspections at 61- or 73-month intervals using Intermediate criteria and review for documentation of unusual circumstances.
- If appropriate after review of the MAR8, perform supplemental frequency interval analysis using current data for recent UW inspections obtained from the State.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges with UW inspections at 61- and 73-month intervals using In-depth sampling criteria.

Population: The population is defined to eliminate reassessment of the same UW inspection interval for the same bridge in successive review years. It also includes bridges indicated by the submitted data to be overdue for UW inspection – those that were due prior to the NBI submission date but did not have a new UW inspection date submitted. The analysis includes the 90/180 day NBIS allowance for entering data and an additional 30 days for compiling of the submittal.

Risk classification is based on substructure/culvert condition and scour vulnerability. All bridges meeting approved extended underwater interval NTE 72-month criteria are considered lower risk. Criteria used:

Metric #8 – Lower risk bridges criteria: (NBI Item 60 or 62)>4 and (NBI Item 113≠ 0, 1, 2, 3, or U)

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

Compliance levels: Compliance levels are based on several cumulative thresholds, which allow consideration of unusual circumstances that can make the completion of UW inspections within the required month impractical or inefficient. The percentages used in the summary of the MAR8 are numerical representations of the compliance level thresholds.

For Compliance (C), while all bridges are expected to meet the meet the NTE 60-/72-month interval, the summary uses 85% for that count, and 100% for 61/73-months. This allows 15% to have been inspected late without further analysis and still be assessed as C if a process is in place to document late UW inspections for unusual circumstances. However, if the 85% threshold is not met, a random sample of those bridges inspected in the 61st/73rd month should be used to determine if unusual circumstances are documented. If all sampled bridges are documented, then the metric can be assessed as C.

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 UW inspection interval into the 61st/73rd month. Such circumstances need to be documented. The thresholds also allow for flexibility so that structures previously inspected earlier than scheduled can get back on the original schedule.

An assessment of C can also be made if there are intervals that exceed the 61st/73rd month and prior approval has been provided by FHWA.

For an assessment of Substantial Compliance (SC), the thresholds allow up to 10% of UW inspections to have been done after the 61st/73rd month but 100% must be done by the 64th/76th month. If these thresholds are exceeded as shown in the MAR8 snapshot, further review of the data as described below may be necessary.

Also note that for SC, a 50% threshold is included in the MAR8 for the NTE 60-/72-month interval. The intent of this threshold is to convey an expectation that at least half of UW inspections should be done 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: Regardless of planned assessment level, the review of this metric begins at the Minimum level with the MAR8 (described below). The MAR8 must be reviewed and, at a minimum, the overdue UW inspections identified must be resolved. See below for additional MAR8 review details.

For the Intermediate and In-depth levels, random sampling of 61-/73-month interval UW inspections is required. This sampling is done to make sure that unusual circumstances leading to late UW inspections are documented.

Where warranted, the review can include obtaining the most recent UW inspection data from the State and performing a supplemental interval analysis. Such analysis should be done after consultation with the State and if there is a reasonable chance that current UW inspections will reveal a higher level of compliance. Include the most recent and previous UW inspections, previous frequency, other data as needed; cover at least 6 consecutive months or 25% of the population being reviewed. BSE assistance is available if such an analysis is needed.

Metric 8 ART Report (MAR8): Accessed from within ART, the MAR8 includes all bridges for the metric population, and is intended to be based on the most recent and previous April NBI submissions. The MAR8 can also be run from the UPACS NBI reports page in Staffnet.

Depending on the summary result, the review may require detailed examination and resolution or overriding of the data. The MAR8 is based on NBI data, which has some known limitations for determining compliance. A few of examples are border bridges where the other State has UW inspection responsibility, where the timing of submitting NBI data has missed an inspection, or the bridge has been replaced or work has been performed that changes the UW inspection schedule.

The interval and overdue status of individual bridges can be viewed on the data tab. Based on review, the status of a bridge can be overridden using the appropriate code. This will usually be the result of the examples mentioned above. The snapshot on the summary tab will automatically update with the override codes.

The data tab includes generated random numbers that can be used to develop the 61st/73rd month random sample.

Background/ changes for PY 2014: *No substantial changes were made to this metric. The metric has been reformatted for improved clarity.*

Background/ changes for 2012: *This metric is revised to assess UW inspection intervals for lower risk bridges. Extended UW inspection interval bridges (2011 Metric #9), are considered lower risk and are included in this metric. UW inspection intervals for higher risk bridges are assessed under revised Metric #9. These revisions allow for a simpler assessment process by combining similar risk UW inspections, and will allow a greater focus on higher risk bridges (Metric #9).*

Review of the establishment of criteria to determine level and frequency for bridges that require UW inspection at less than 60-month intervals have been moved to Metric #11. Review of UW inspection dates to verify that bridge records match the data recorded in the NBI has been moved from this metric to Metric #22. Inspection quality (i.e. does the inspection meet acceptable UW inspection procedures as described in the MBE) is assessed under Metric #12 instead of this metric.

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

Criteria

- UW inspections are performed at regular intervals not to exceed (NTE) 60-months.
- Higher risk bridges are defined for this metric as those with a substructure or culvert condition rating of poor or worse, or evaluated as scour critical.

Population: Higher risk bridges for the entire State or selected geographic/owner subset that require UW inspections, are open to traffic, and whose UW inspection dates have changed since the previous year’s NBI submission or whose inspection UW inspections 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.
- All sampled 1-month delayed UW inspections are documented for unusual circumstances.

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 one-month.
- 100% of UW inspections are performed within the required interval plus four-months.

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 the following if PCA in effect:

- Monitor PCA.
- Review Metric 9 ART Report (MAR9) to resolve all overdue UW inspections.

Otherwise, perform all of the following:

- Review MAR9 to resolve all overdue UW inspections and other issues indicated on the MAR9’s Summary tab (see commentary).
- Where a SC snapshot is indicated in the MAR9 and all bridges are inspected within a 61 interval, perform first bullet under Int-AL below.
- Consider supplemental analysis using current data as described in the Int-AL where changes in procedures have occurred.

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

- Randomly sample bridges with UW inspections at 61-month intervals using Intermediate sampling criteria and review for documentation of unusual circumstances.
- If appropriate after review of the MAR9, perform supplemental frequency interval analysis using current data for recent UW inspections obtained from the State.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges with UW inspections at 61-month intervals using In-depth sampling criteria.

Population: The population is defined to eliminate reassessment of the same UW inspection interval for the same bridge in successive review years. It also includes bridges indicated by the submitted data to be overdue for UW inspection – those that were due prior to the NBI submission date but did not have a new UW inspection date submitted. The analysis includes the 90/180 day NBIS allowance for entering data and an additional 30 days for compiling of the submittal.

Risk classification is based on substructure/culvert condition and scour vulnerability. Criteria used:

Metric #9 – Higher risk bridges criteria: (NBI Item 60 or 62)<5 or (NBI Item 113= 0, 1, 2, 3, or U)

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

Compliance levels: Compliance levels are based on several cumulative thresholds, which allow factoring in unusual circumstances that can make the completion of UW inspections within the required month impractical or inefficient. The percentages used in the summary of the MAR9 are numerical representations of the compliance level thresholds.

For Compliance (C), while all bridges are expected to meet the meet the NTE 60-month interval, the summary uses 95% for that count, and 100% for 61-months. This allows 5% to have been inspected late without further analysis and still be assessed as C if there is a process in place to document late UW inspections for unusual circumstances. However, if the 95% threshold is not met, a random sample of those bridges inspected in the 61st month should be used to determine if unusual circumstances are documented. If all sampled bridges are documented, then the metric can be assessed as C.

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 UW inspection interval into the 61st month. Such circumstances need to be documented. The thresholds also allow for flexibility so that structures previously inspected earlier than scheduled can get back on the original schedule.

An assessment of C can also be made if there are intervals that exceed the 61st month and prior approval has been provided by FHWA.

For an assessment of Substantial Compliance (SC), the thresholds allow up to 5% of UW inspections to have been done after the 61st month but 100% must be done by the 64th month. If these thresholds are exceeded as shown in the MAR9 snapshot, further review of the data as described below may be necessary.

Also note that for SC, a 50% threshold is included in the MAR9 for the NTE 60-month interval. The intent of this threshold is to convey an expectation that at least half of UW inspections should be done 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: Regardless of planned assessment level, the review of this metric begins at the Minimum level with the MAR9 (described below). The MAR9 must be reviewed and, at a minimum, the overdue inspection UW inspections identified must be resolved. See below for additional MAR9 review details.

For the Intermediate and In-depth levels, random sampling of 61-month interval inspection UW

inspections is required. This sampling is done to make sure that unusual circumstances leading to late inspection UW inspections are documented.

Where warranted, the review can include obtaining the most recent inspection UW inspection data from the State and performing a supplemental interval analysis. Such analysis should be done after consultation with the State and if there is a reasonable chance that current inspection UW inspections will reveal a higher level of compliance. Include the most recent and previous UW inspections, previous frequency, other data as needed; cover at least 6 consecutive months or 25% of the population being reviewed. BSE assistance is available if such an analysis is needed.

Metric 9 ART Report (MAR9): Accessed from within ART, the MAR9 includes all bridges for the metric population, and is intended to be based on the most recent and previous April NBI submissions. The MAR9 can also be run from the UPACS NBI reports page in Staffnet.

Depending on the summary result, the review may require detailed examination and resolution or overriding of the data. The MAR9 is based on NBI data, which has some known limitations for determining compliance. A few of examples are border bridges where the other State has UW inspection responsibility, where the timing of submitting NBI data has missed an inspection, or the bridge has been replaced or work has been performed that changes the UW inspection schedule.

The interval and overdue status of individual bridges can be viewed on the data tab. Based on review, the status of a bridge can be overridden using the appropriate code. This will usually be the result of the examples mentioned above. The snapshot on the summary tab will automatically update with the override codes.

The data tab includes generated random numbers that can be used to develop the 61st month random sample.

Background/ changes for PY 2014: *No substantial changes were made to this metric. The metric has been reformatted for improved clarity.*

Background/ changes for 2012: *This metric is revised to assess UW inspection intervals for higher risk bridges. Extended UW inspection interval bridges (2011 Metric #9) are considered lower risk and are included in Metric #8. These revisions allow for a simpler assessment process by combining similar risk inspections, and will allow a greater focus on higher risk bridges.*

Review of the establishment of criteria to determine level and frequency for bridges that require UW inspection at less than 60-month intervals have been moved to Metric #11. Review of inspection dates to verify that bridge records match the data recorded in the NBI has been moved from this metric to Metric #22. Inspection quality (i.e. does the inspection meet acceptable routine inspection procedures as described in the MBE) is assessed under Metric #12 instead of this metric.



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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 for the entire State or selected geographic/owner subset that require FCM inspections, are open to traffic, and whose FCM inspection dates have changed since the previous year’s NBI submission or whose FCM inspections 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 1-month delay for any FCM inspections.
- All sampled 1-month delayed FCM inspections are documented for unusual circumstances.

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 one-month.
- 100% of FCM inspections are performed within the required interval plus four-months.

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 the following if PCA in effect:

- Monitor PCA.
- Review Metric 10 ART Report (MAR10) to resolve all overdue FCM inspections.

Otherwise, perform all of the following:

- Review MAR10 to resolve all overdue FCM inspections and other issues indicated on the MAR10’s Summary tab (see commentary).
- Where a SC snapshot is indicated in the MAR10 and all FCM inspections are performed within a 25-month interval, perform first bullet under Int-AL below.
- Consider supplemental analysis using current data as described in the Int-AL where changes in procedures have occurred.

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

- Randomly sample bridges with FCM inspections performed at 25-month intervals using Intermediate sampling criteria and review for documentation of unusual circumstances.
- If appropriate after review of the MAR10, perform supplemental frequency interval analysis using current data for recent FCM inspections obtained from the State.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges with FCM inspections at 25-month intervals using In-depth sampling criteria.

Population: The population is defined to eliminate reassessment of the same FCM inspection interval for the same bridge in successive review years. It also includes bridges indicated by the submitted data to be overdue for FCM inspection – those that were due prior to the NBI submission date but did not have a new FCM inspection date submitted. The analysis includes the 90/180 day NBIS allowance for entering data and an additional 30 days for compiling the submittal.

Compliance levels: Compliance levels are based on several cumulative thresholds, which allow consideration of unusual circumstances that can make the completion of FCM inspections within the required month impractical or inefficient. The percentages used in the summary of the MAR10 are numerical representations of the compliance level thresholds.

For Compliance (C), while all bridges are expected to meet the meet the NTE 24-month interval, the summary uses 95% for that count, and 100% for 25-months. This allows 5% to have been inspected late without further analysis and still be assessed as C if a process is in place to document late FCM inspections for unusual circumstances. However, if the 95% threshold is not met, a random sample of those bridges inspected in the 25th month should be used to determine if unusual circumstances are documented. If all sampled bridges are documented, then the metric can be assessed as C.

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 FCM inspection interval into the 25th month. Such circumstances need to be documented. The thresholds also allow for flexibility so that structures previously inspected earlier than scheduled can get back on the original schedule.

An assessment of C can also be made if there are intervals that exceed the 25th month and prior approval has been provided by FHWA.

For an assessment of Substantial Compliance (SC), the thresholds allow up to 5% of FCM inspections to have been done after the 25th month but 100% must be done by the 28th month. If these thresholds are exceeded as shown in the MAR10 snapshot, further review of the data as described below may be necessary.

Also note that for SC, a 50% threshold is included in the MAR10 for the NTE 24-month interval. The intent of this threshold is to convey an expectation that at least half of inspections should be done 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: Regardless of planned AL, the review of this metric begins at the Min-AL with the MAR10 (described below). The MAR10 must be reviewed and, at a minimum, the overdue FCM inspections identified must be resolved. See below for additional MAR10 review details.

For the Int-AL and InD-ALs, random sampling of 25-month interval FCM inspections is required. This sampling is done to make sure that unusual circumstances leading to late FCM inspections are documented.

Where warranted, the review can include obtaining the most recent FCM inspection data from the State and performing a supplemental interval analysis. Such analysis should be done after consultation with the State and if there is a reasonable chance that current FCM inspections will reveal a higher level of compliance. Include the most recent and previous FCM inspections, previous frequency, other data as needed; cover at least 6 consecutive months or 25% of the population being reviewed. BSE assistance is available if such an analysis is needed.

Metric 10 ART Report (MAR10): Accessed from within ART, the MAR10 includes all bridges for the metric population, and is intended to be based on the most recent and previous April NBI submissions. The MAR10 can also be run from the UPACS NBI reports page in Staffnet.

Depending on the summary result, the review may require detailed examination and resolution or overriding of the data. The MAR10 is based on NBI data, which has some known limitations for determining compliance. A few examples are border bridges where the other State has FCM inspection responsibility, where the timing of submitting NBI data has missed an FCM inspection, or the bridge has been replaced or work has been performed that changes the FCM inspection schedule.

The interval and overdue status of individual bridges can be viewed on the data tab. The status of a bridge can be overridden using the appropriate code. This will usually be the result of the examples mentioned above. The snapshot on the summary tab will automatically update with the override codes.

The data tab includes generated random numbers that can be used to develop the 25th month random sample.

Background/ changes for PY 2014: *No substantial changes were made to this metric. The metric has been reformatted for improved clarity.*

Background/ changes for 2012: *FCM inspection interval thresholds for used to determine compliance levels have been revised.*

Review of the establishment of criteria to determine level and frequency for bridges that require FCM inspection at less than 24-month intervals have been moved to Metric #11. Review of FCM inspection dates to verify that bridge records match the data recorded in the NBI has been moved from this metric to Metric #22. Inspection quality (i.e. does the inspection meet acceptable inspection procedures as described in the MBE) is assessed under Metric #12 instead of this metric.



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

Criteria	<p>Criteria is established to determine level of inspection, and frequency for all of the following inspection types where appropriate:</p> <ul style="list-style-type: none"> ○ 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
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Population: Bridges for the entire State or selected geographic/owner subset that meet established criteria, are open to traffic, and whose inspection dates have changed since the previous year's NBI submission.

Compliance Levels	<p>Compliance (C): All of the following must be met for C:</p> <ul style="list-style-type: none"> • All level of inspection and frequency criteria are established. • Records for all sampled bridges indicate the appropriate level of inspection and frequency in accordance with the established criteria. <p>Substantial Compliance (SC): All of the following must be met for SC:</p> <ul style="list-style-type: none"> • All level of inspection and frequency criteria are established. • Records for less than all sampled bridges indicate the appropriate level of inspection and frequency in accordance with the established criteria. <p>Non-Compliance (NC): One or more SC criteria not met.</p> <p>Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).</p>
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Assessment Levels (AL)	<p>Minimum Assessment (Min-AL): Perform all of the following:</p> <ul style="list-style-type: none"> • Monitor PCA if in effect. • Assess based on previous review results, the reviewer's knowledge and awareness of the State's level of inspection and frequency criteria. <p>Intermediate Assessment (Int-AL): In addition to the Min-AL:</p> <ul style="list-style-type: none"> • Review established level of inspection and frequency criteria. • Randomly sample bridges that meet the established criteria using Intermediate sampling criteria, and review bridge inspection records for adherence to established criteria. <p>In-Depth Assessment (InD-AL): In addition to the Int-AL:</p> <ul style="list-style-type: none"> • Similar as intermediate level, but use In-depth sampling criteria.
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Criteria: It is understood that 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 sampled bridge records are found that do not adhere to the established level and frequency criteria, the PM is to be notified of the finding in writing and the metric should be assessed as Substantial Compliance (SC) (review of sampled bridge records will not result in Non Compliance (NC)).

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

Assessment levels: For the Intermediate and In-depth levels, a single random sample is to be developed from all 6 established criteria. The reviewer should attempt to independently use the established criteria to develop the metric population from NBI data.

The portion of the population for bridges requiring damage, in-depth and special inspections, will likely need to be obtained and merged with the metric population developed from the other criteria. Where the metric population cannot be developed from NBI data, the reviewer should work with the State to develop this population.

Background/ changes for PY 2014: *No substantial changes were made to this metric. The metric has been reformatted for improved clarity.*

Background/ changes for 2012: *This metric is revised to add the review of the establishment of criteria to determine level and frequency for bridges that require more frequent 1) routine, 2) FCM inspections, and 3) underwater inspections.*

Sampling of bridges that adhere to the established criteria has been added.

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

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

Population: All bridges randomly sampled for Metrics 13 through 19, and 21.

Compliance Levels

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

- At least 90% of inspection reports meet criteria for quality assessments, ratings, and documentation.
- A qualified team leader is on site for 100% of inspections.

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

- At least 80% of inspection reports meet criteria for quality assessments, ratings, and documentation.
- A qualified team leader is on site for 100% of inspections.

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 a minimum of 20 selected bridges to compare inspection reports with actual bridge conditions to evaluate:
 - 1) Accuracy of condition codes
 - 2) Thoroughness of inspections to identify and determine significance of deficiencies
 - 3) Adequacy of documentation and appropriate justification of determined ratings

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

- Review records and reports of selected bridges to ensure a qualified team leader was present at each applicable inspection.
- Consider using unannounced field verification of some ongoing inspections to observe team leader presence and inspection procedures.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Perform a minimum of 10 additional file and field reviews.
- Use unannounced field verification of some ongoing inspections to observe team leader presence and inspection procedures.
- Request information on inspection rates for each team leader and review for reasonableness.

General: The purpose of Metric 12 is to assess whether or not the bridge inspections being performed are thorough, contributing to accurate results that are well documented, and conducted by a qualified team leader. This is primarily intended to be assessed by reviewing inspection reports, and comparing those to the actual site conditions observed during the field reviews. It should be noted that Metric 22 is also assessed during every field review. Metric 12, as noted below, is focusing on the four main condition codes resulting from the inspection, whereas Metric 22 assesses other NBI data items associated with the bridge record (and intentionally excludes the condition items already assessed under Metric 12). Metric 12 is focused on inspection quality, whereas Metric 22 is focused on the quality of bridge data in the NBI.

Team Leader refresher training is no longer assessed under this metric, rather it is assessed under Metric 3 for individual training, and Metric 20 for periodic refresher training requirements.

Nationally recognized acceptable inspection procedures are listed in the MBE, and further detailed in the *Bridge Inspectors' Reference Manual* (BIRM), and the comprehensive training course.

Population: The process for identifying bridges to be reviewed for this metric is further explained in the *Field Review Guidance* in Chapter 2 of the Bridge Program Manual.

Compliance levels: *Generally acceptable tolerances* for condition assessments are when the inspector determined NBI condition codes are within one value of the review team's (FHWA/State), and/or the inspector determined element level data are in the proper conditions states, with elements and quantities properly determined. Properly determined element level data should identify at least 80% of the elements and quantities, be generally supportive of the NBI condition codes, and any actual Condition State 4 condition must be accounted for and described in the report. Until element level data is required for reporting to the NBI, only evaluate the main component NBI condition codes, Items 58, 59, 60, and 62, for this metric when determining compliance. Any findings of deficient element level data should be discussed with the State, but should not influence the compliance determination.

Percentages for measuring compliance should be determined based on the number of bridges field reviewed. For example, one bridge may have current inspection reports for routine, fracture critical and underwater 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. If the three reports are judged to have the four condition codes within acceptable tolerances, it would be a positive data point toward compliance.

In another scenario, if 20 bridges selected for field review had 25 current NBIS inspection reports (five are inspections other than routine), the denominator to use for the percentage calculation should be 20 (not 25). If 18 of the 20 bridges had all condition codes within acceptable tolerances (18/20, or 90%), the determination for this factor would be compliant. Each of the factors associated with percentages – condition codes, identified notable deficiencies, suitable documentation, qualified team leader presence – should be calculated in this way, independent from each other. If three of the four factors met compliance thresholds, but all notable deficiencies were only identified on 16 of the 20 bridges (80%), the metric compliance level would be substantial compliance.

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

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 fairly concise narrative, as the condition worsens more is required, which will probably also include photos, sketches, measurements, etc., to fully document the identified deficiencies and support the assigned condition rating.

Assessment levels: Comparing the team leader designated on the inspection report to an approved list of team leaders provided by the program manager will provide evidence that a qualified team leader was present. If you become aware that there is a problem with the qualifications of a team leader(s), this should be assessed under Metric 3 and explained accordingly.

Background/ changes for PY 2014: *There are no substantial changes to this metric; the changes are only for clarification, further guidance, and formatting.*

Background for 2012 changes: *Revised this metric to incorporate 650.313(a), which requires bridges to be inspected according to recognized standards, instead of just (b), which requires a team leader to be present during the inspection. This metric now considers the quality of inspections performed under the NBIS. Also, modified SC criteria to remove reduced qualifications of team leader as this is covered by Metric 3, and added a commentary section to give further insight into the intended meaning of certain terms or concepts. Sampling and assessments for this metric were changed to recognize that this metric can only be meaningfully assessed by reviewing bridges in the field, and also acknowledging the annual NBIP review expectation that a minimum number of field reviews are to be performed each year.*



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NBIS Reference: 23 CFR 650.313 (c) – Rate each bridge

Criteria

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

Population: For Intermediate and In-depth Assessments: all bridges in the entire State or selected geographic/owner subset. For the Metric 13 ART Report (MAR13): all bridges in the entire State.

Compliance Levels

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

- All higher and lower risk bridges have a load rating in accordance with the MBE.
- All higher and lower risk bridge load ratings are accurate for current conditions.

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

- All higher risk bridges have a load rating in accordance with the MBE.
- At least 95% of lower risk bridges have a load rating in accordance with the MBE.
- Load ratings may have minor or isolated documentation or NBI reporting 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 and resolve identified compliance deficiencies.
- Assess based on previous review results and the reviewer’s knowledge and awareness of State load rating practices.

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

- Randomly sample using intermediate sampling criteria to verify bridges have load rating calculations or that documented determinations exist, as appropriate.
- Include site visits of some of the sample bridges in the field review for Metric 12 and 22.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample using in-depth sampling criteria to verify load rating calculations, assumptions and methodology.
- Review policies and procedures to ensure consistency with legal and permit load laws and regulations.
- Review a sampling (either intermediate or in-depth assessment sampling criteria) of bridge files identified as having MAR13 data inconsistencies and errors, and compliance deficiencies to confirm, or resolve these items, as appropriate.

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

Population: *Higher risk bridges* for this metric are those bridges with:

- NBI condition ratings of 4 (Poor) or less for Superstructure (Item 59), Substructure (Item 60), or Culvert (Item 62)
- 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: For SC, *minor or isolated documentation deficiencies* include difficulty in following the calculations, missing a stamp or signature, valid but unclear assumptions, etc. *NBI reporting deficiencies* include failure to report load ratings for NHS bridges to the NBI as determined by the load factor (LF) or load and resistance factor (LRFR) methods (see the 10/30/2006 FHWA policy memo).

Determine the compliance level by calculating the higher risk and lower risk bridge subsets separately, and then use the most critical result. Two examples:

- 100% of higher risk bridges and only 97% of lower risk bridges have valid load ratings; the determination would be SC (97% of lower risk bridges > 95% SC).
- 98% of both higher and lower risk bridges have valid load ratings; the determination would be NC (98% < 100% for SC threshold for higher risk bridges, so the metric would be NC even though the threshold for lower risk bridges would have yielded SC).

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 rating would not be considered NC. If the timeframe has been exceeded, or if no timeframe is established and the delay is deemed too long by the reviewer, this would be considered NC. If the need for a re-rating was identified during the inspection, then the updated data should include updated load rating values as appropriate.

Assessment levels: Assessment of this metric begins with investigation of the MAR13 for all assessment levels, but also includes review of a sampling of files and field reviews at the Int-AL and InD-AL.

Metric 13 ART Report (MAR13): The MAR13 includes all bridges for the metric population, and is based on the most recent and previous April NBI submissions. The MAR13 can also be run from the UPACS NBI reports page in Staffnet.

The MAR13 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 and Int-AL, the compliance deficiencies identified on the *Summary* and data tabs as red items, need to be resolved by:

1. Informing the State of the compliance deficiencies, and the NC or SC determination based on the MAR13.
2. 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, change review to Int-AL or InD-AL.

The data tab provides columns for manually overriding the evaluation result and for providing comments or explanations based on your review.

At the InD-AL, the data inconsistencies and errors in the MAR13, identified as yellow items are evaluated, in addition to the compliance deficiencies. A random sample of bridges from this list (distinct from the sample from the normal population for this metric) should be assessed to determine if the inconsistencies and errors need correcting. Some data inconsistencies could be valid for reasons such as substructure rating criteria, transitions to new coding definitions for Items 63 and 65, etc. Other inconsistencies found may not be valid and would need to be corrected, leading to a determination of SC and a resulting IP.

Sampling of files: At the Int-AL and InD-AL, a random sample of bridge files is selected for review. *Verify bridges have load rating calculations or that documented determinations exist* at the Int-AL involves not only insuring these exist, but that the results are consistent with other bridge information contained in the file and in the NBI.

Additionally at the InD-AL, *verify load rating calculations, assumptions and methodology* includes insuring consistency between the calculations and the load rating summary information, checking suitability of rating vehicles, software program used, etc. Load rating *assumptions* such as LRFR considerations for condition, significance of or changes to dead load, impact forces, and effectiveness of enforcement should be noted in the load rating file and verified for actual conditions.

Proper evaluation of the load rating file, and load rating *policies and procedures* requires familiarity with current policies regarding assigned ratings (5 prerequisite conditions contained in the 9/29/2011 HIBT memo), rating vehicles (including AASHTO's SHVs), and other MBE provisions. Assigning a rating after satisfying the 5 conditions is different than establishing a load rating through engineering judgment as prescribed in the AASHTO Manual. Engineering judgment is allowed by the MBE in certain circumstances, primarily when a bridge is old with no plans and no way to assess the section properties (such as rebar size in a slab bridge). It is recommended to include FHWA Resource Center or Headquarters load rating specialists when conducting an InD-AL review.

Field reviews: The process for determining the number and selection of sample bridges from Metric 13 for inclusion in the field review for Metrics 12 and 22 is covered in the Field Review Guidance section of this document.

When performing Int-AL or InD-AL of this metric, evaluate the accuracy and compatibility of load rating NBI items for all bridges selected for field review, dovetailing with the Metric 22 assessment. It is recommended to include these items as part of an Int-AL or InD-AL of Metric 22 when this level of assessment is undertaken for Metric 13. NBI data quality will still be

assessed under Metric 22, but this will determine if the load rating related data is accurate, consistent, and compatible. If Metric 22 is assessed at the Min-AL, discrepancies or errors in these items should be corrected, but the data should not impact the compliance determination of Metric 22 unless those data items were selected for the Metric 22 assessment.

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

Memo links:

2/2/2011 memo: <http://www.fhwa.dot.gov/bridge/110202.cfm>

11/15/2011 memo: <http://www.fhwa.dot.gov/bridge/nbi/111115.cfm>

9/29/2011 memo: <http://www.fhwa.dot.gov/bridge/110929.cfm>

Background/ changes for PY 2014: *The evaluation of appropriate NBI data items via a Metric 13 ART Report is incorporated into the assessment of this metric. Compliance deficiencies identified in the NBI data are now resolved at the Min-AL since they have a direct impact on safety, and represent a higher risk. Other MAR13 issues represent potential deficiencies, but require follow-up to resolve; hence they are evaluated at the InD-AL. These changes more appropriately focus the assessment to identify and promptly resolve the highest risks.*

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.

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: For Intermediate and In-depth Assessments: bridges requiring posting for the entire State, or selected geographic/owner subset. For the Metric 14 ART Report (MAR14): all bridges in the entire State.

Compliance Levels

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

- All bridges are properly posted or restricted as required.
- All posting/closing compliance deficiencies indicated in the MAR14 or identified in the field or file reviews are promptly resolved.

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

- Posting deficiencies are promptly resolved, but no maximum timeframe for correction has been established.
- All current posting/closing compliance deficiencies indicated in the MAR14 or identified in the field or file reviews are promptly resolved.

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 MAR14 to resolve all posting/closing compliance deficiencies.
- Assess based on previous review results and the reviewer's knowledge and awareness of the Agency's load posting practices.

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

- Randomly sample bridges using Intermediate criteria to verify that the posting signs are in place and correspond to the load rating recommendations, and to evaluate data inconsistencies and errors identified by the MAR14.
- Include site visits of some posted bridges in the sample of field review bridges for Metric 12 and 22 to verify that the posting signs exist and are appropriate for the current load rating and posting recommendations, and that NBI load posting items are correctly coded.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges using In-depth sampling criteria.
- Monitor State's listing of posted or restricted bridges, and related critical findings.

Population: *Bridges identified as needing to be or which are posted* are those that have Item 70 < 5, or Item 41 = B, D, E, K, P or R, or Item 31 < 3, or Item 64 < 20 metric tons. The threshold for Item 64 of less than 20 metric tons is, of course, if this item is reported as a tonnage. If this item is reported alternately as a rating factor, the appropriate conversion is made.

Compliance levels: *Promptly resolved* means resolving within the timeframe stipulated in the load posting procedures. FHWA recommends as soon as possible, not to exceed 90 days, depending on criticality, if no timeframe has been established. 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.), we recognize that posting much quicker is important to insure 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 once they are notified or discover the problem. For example, some consider a missing posting sign a critical finding and have established an allowable timeframe to reinstall the sign. Similarly, once it is determined a bridge needs to be restricted for loads, the new signs need to be installed promptly. If the owner is able to install the missing, damaged or new posting signs within the agreed upon timeframe they would be considered to have resolved the deficiency. If the owner has no established timeframe, but still promptly resolves it a determination of substantial compliance is warranted. If an owner does not address the issue of posting deficiencies, this should be considered non-compliant.

Consider *substandard signs* to be SC.

Assessment levels: The process for determining the number and selection of sample bridges for inclusion in the field review sample for Metric 12 and 22 is covered in the Field Review Guidance section of this document.

Resolve all identified posting/closing compliance deficiencies in the MAR14 means following up on identified items and determining if they are just data errors that need to be corrected, or if bridges still need to be posted. Confirm the accuracy of the data, and resolve the compliance issue(s). If the bridge has since been posted within the established timeframes, this would be considered resolved. If any bridge needs to be posted and hasn't been as yet, and the established timeframes have been exceeded (or 90 days if no timeframe is established), this is considered non-compliance. Such situations need to be addressed promptly with the State, and communicated 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 ART.

Monitoring the *State's listing of posted or restricted bridges* allows a comparison of what is reported to the trucking industry and what our NBI bridge data shows.

Load posting NBI items are those related to, or which 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- and InD-ALs these are reviewed during field reviews for compatibility between items and accuracy as confirmed by the site visits. It is recommended to include these items as part of an Intermediate or In-depth Assessment of Metric 22 when this level of assessment is undertaken for Metric 14.

In some cases, bridges appear on the Metric 14 sample as needing posting, are coded 'R' for Item 41, and

are 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 on each bridge of the parkway, then the code of 'R' is sufficient to indicate that the bridge is restricted and does not need to be individually posted.

Metric 14 ART Report (MAR14): The MAR14 includes all bridges for the metric population, and is based on the most recent and previous April NBI submissions. The MAR14 can also be run from the UPACS NBI reports page in Staffnet.

The MAR14 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 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 your review.

Posting/closing compliance deficiencies are those identified as red items in the MAR14. (Note: These include the "safety related checks" of the NBI submission, but also incorporate more data checks).

MAR14 *data inconsistencies and errors* are those identified as yellow items in the report.

Background/ changes for PY 2014: *The evaluation of appropriate NBI data items via a Metric 14 ART Report is incorporated into the assessment of this metric. Posting/closing compliance deficiencies identified in the NBI data are resolved at the Min-AL, since they have a direct impact on safety and represent a higher risk. These changes more appropriately focus the assessment to identify and promptly resolve the highest risks using existing NBI data.*

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.



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

Criteria	<p>Bridge files are prepared as described in the AASHTO Manual to maintain and record the following:</p> <ul style="list-style-type: none"> ○ Significant bridge file components ○ Results of bridge inspections together with notations of any action taken to address the findings of such inspections ○ Relevant maintenance and inspection data to allow assessment of current bridge condition ○ Findings and results of bridge inspections
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Population: Bridges for the entire State or selected geographic/owner subset.

Compliance Levels	<p>Compliance (C): All of the following must be met for C:</p> <ul style="list-style-type: none"> • All bridges have files. • All files have the applicable significant components. <p>Substantial Compliance (SC): All of the following must be met for SC:</p> <ul style="list-style-type: none"> • All bridges have files. • At least 85% of files have the applicable significant components. <p>Non-Compliance (NC): One or more SC criteria not met.</p> <p>Conditional Compliance (CC): Adhering to FHWA approved plan of corrective action (PCA).</p>
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Assessment Levels (AL)	<p>Minimum Assessment (Min-AL): Perform all of the following:</p> <ul style="list-style-type: none"> • Monitor PCA if in effect. • Assess based on previous review results and the reviewer’s knowledge and awareness of State’s practices. <p>Intermediate Assessment (Int-AL): In addition to the Min-AL:</p> <ul style="list-style-type: none"> • Randomly sample bridges using Intermediate criteria 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. • Include site visits of some of the sample bridges in the field reviews for Metric 12 and 22. <p>In-Depth Assessment (InD-AL): In addition to the Int-AL:</p> <ul style="list-style-type: none"> • Randomly sample bridges using In-depth criteria.
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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
- 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

It is expected that most of the components of a bridge file will be in the same location; however, if there are items which are not included in the bridge file, the file should reference where the information is located. The bridge file can be electronic or 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. Reviewing these files may be done electronically, by requesting mailed copies, or by visiting the remote offices.

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 Manual (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, 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 changes and their effectiveness moving forward in time in evaluating the adequacy of these components, and not require full histories that are unrecoverable.

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 are considered the minimum requirements. The exceptions would be those components that don't apply to that particular bridge. For example, a scour assessment would not be needed if the bridge was not over water, no posting documentation would be needed if calculated load capacities were high enough that it wasn't necessary, etc.

For another example, consider in reviewing a sample of 19 bridges at the intermediate level, one bridge file is found to be missing a needed scour assessment, a second is found to be missing both load rating calculations and stream cross-sections for a scour critical bridge, and the remaining bridge files are found complete. The compliance percentage would be calculated as 17/19, or 89.5%, yielding a substantial compliance determination for the metric.

Assessment levels: The process for determining the number and selection of sample bridges for inclusion in the field reviews for Metric 12 and 22 is covered in the Field Review Guidance section of this document.

***Background/ changes for PY 2014:** Percentages for substantial compliance have been adjusted slightly in consideration that most reviews at the intermediate level yield sample sizes of 19. This change allows a substantial compliance finding where two bridge files to have deficiencies, instead of just one as in the original metric. The list of significant file components has been revised in conjunction with FHWA's work with AASHTO on this subject.*

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.



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

Criteria

- Bridges with FCMs have written inspection procedures which clearly identify the location of all FCMs, specify the frequency of inspection, describe any specific risk factors unique to the bridge, and clearly detail inspection methods and equipment to be employed.
- FCMs are inspected according to those procedures.

Population: Bridges for the entire State, or selected geographic/owner subset, with FCMs.

Compliance Levels

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

- All bridges with FCMs have written inspection procedures.
- All bridges with FCMs are inspected according to those procedures.

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

- All bridges with FCMs have written inspection procedures; the procedures may have minor or isolated deficiencies, but the deficiencies do not adversely affect the effectiveness of the FCM inspections.
- All 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 using Intermediate criteria.
- Verify that sample FCM bridge files contain inspection procedures, and the inspection procedures are followed and documented in the FCM inspection report.
- Include site visits of some sample bridges in the field review sample for Metric 12 and 22.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges using In-depth criteria.
- Field review some sample bridges during actual FCM inspections to ensure procedures are being followed.
- Review NBI bridge data to check independently if any bridges not identified as requiring FCM inspections may require FCM inspection.

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

Specific risk factors 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
- high ADTT (can be taken as 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, other), can be important for determining proper inspection procedures. Load induced is typically the most predictable, whereas the others are less predictable (with more inherent risk). Knowing the lowest anticipated service temperature is an important factor in determining susceptibility to cracking.

Bridges posted because of a controlling FCM, which may or may not 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 developed for the bridge adequately addresses these items, and also whether the inspection reports adequately address them when appropriate.

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, maybe inspection methods of visual and UT are listed, but it is unclear which members are to 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 to be considered minor.

Assessment levels: The process for determining the number and selection of sample bridges for inclusion in the field review sample for Metric 12 and 22 is covered in the Field Review Guidance section of this document.

Acceptable *written 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 insure 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. AASHTO's 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 each bridge which 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, many times as an introductory section, and this is certainly an acceptable practice.

Bridges sampled, but not field reviewed, should have the inspection procedures and the inspection reports evaluated likewise. While there is no field assessment in this case, the procedures and reports can be compared to the bridge plans.

The field review of some of the sample bridges should verify inspection access requirements, actual conditions, and locations of FCMs, in addition to the other aspects of field review conducted under Metric 12 and 22.

For InD-AL, identifying bridges with as yet unidentified FCMs could include searching for truss bridges, girder and floor beam bridges, moveable bridges, steel pier caps, querying element level data, etc.

Background/ changes for PY 2014: Risk is incorporated into this metric with the modification to the compliance threshold percentages used in the 2011 metrics baseline (Metric 10 – FCM Inspection Frequency). The risk associated with FCMs is assessed by looking at the bridge, examining whether the developed inspection procedures are adequate, and if the report documents a thorough inspection was done in accordance with the prescribed procedures. The 2011 metrics evaluated risk by assessing if 100% of inspections were done on time for the riskier bridges, and 99% for all others. This change to focus on the quality of the inspection procedures, and resulting inspection, more appropriately identifies risks and evaluates measures to mitigate those risks.

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.



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NBIS Reference: 23 CFR 650.313 (e) & (e)(1) – Bridges requiring underwater (UW) inspections

- Criteria**
- Bridges requiring UW inspections have written inspection procedures which clearly identify the location of all UW elements, specify the frequency of inspection, describe any specific risk factors, and clearly detail inspection methods and equipment to be employed.
 - UW elements are inspected according to those procedures.

Population: Bridges for the entire State, or selected geographic/owner subset, requiring underwater inspection.

- Compliance Levels**
- Compliance (C):** All of the following must be met for C:
- All bridges requiring UW inspection have written inspection procedures.
 - All 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 bridges requiring UW inspections have written 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 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 using Intermediate criteria.
 - Verify that sample bridge files contain UW inspection procedures, and the inspection procedures are followed and UW.
 - Include site visits of some sample bridges in the field review sample for Metric 12 and 22.
- In-Depth Assessment (InD-AL):** In addition to the Int-AL:
- Randomly sample bridges using In-depth criteria.
 - Field review some sample bridges during actual UW inspections to ensure procedures are being followed.
 - Review NBI bridge data to check independently if any bridges not identified as requiring UW inspections may require UW inspection.

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

Acceptable written underwater 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 need to be communicated to the inspection team leader to insure 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.), scheduling considerations (lake draw down, canal dry time, etc.). 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 underwater inspections; however, each bridge with elements requiring underwater inspection must have written inspection procedures specific to each bridge which 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, many times as an introductory section, and this is certainly an acceptable practice.

The assessment of this metric considers the risks of bridges which cross over waterways. The proper 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 which 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 which may affect the inspection such as black water, or rapid stream flows should also be identified and accounted for in the inspection methods. Water environment and structural systems or materials which may combine for accelerated deterioration of the bridge elements should be identified such as highly corrosive water, unprotected steel members, timber piling in the presence of teredos or limnoria, etc. By identifying these conditions or risk factors, the underwater inspectors 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 any evidence of risk factors or unique circumstances or conditions at each site. Then evaluate

whether the underwater inspection procedures developed for these bridges adequately address these items, and also whether the inspection reports adequately address them, as appropriate.

Bridges sampled, but not field reviewed, should have the inspection procedures and the inspection reports evaluated likewise, but recognizing that there is no field assessment in this case.

Assessment levels: The process for determining the number and selection of sample bridges for inclusion in the field review sample for Metric 12 and 22 is covered in the Field Review Guidance section of this document.

Background/ changes for PY 2014: *There are no substantial changes to this metric; the changes are only for clarification, further guidance, and formatting.*

Background for 2012 changes: *Risk is incorporated into this metric by reviewing the risk items associated with bridges having underwater elements, which includes scour. This change is made in conjunction with a change to modify the compliance threshold percentages used in the 2011 metrics baseline for the risk categories in Metrics 8 & 9 (underwater inspection frequencies). Risk is assessed in this metric by looking at the bridge, examining whether the developed inspection procedures are adequate, and if the report documents a thorough inspection was done in accordance with the prescribed procedures. The 2011 metrics evaluated risk by assessing if 100% of inspections were done on time for the riskier bridges. This change more appropriately identifies risks and evaluates measures to mitigate those risks.*

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.



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NBIS Reference: 23 CFR 650.313 (e) 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, or selected geographic/owner subset, that are scour critical, scour vulnerable, tidal, or have unknown foundations.

Compliance Levels

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

- All bridges over water have a documented scour evaluation.
- All bridges that are scour critical, scour vulnerable, or have unknown foundations have a scour POA prepared to monitor and/or address critical findings.
- All bridges are monitored in accordance with the POA, as appropriate.

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

- All bridges over water have a documented scour evaluation.
- All bridges that are scour critical, scour vulnerable, or have unknown foundations have a scour POA prepared to monitor and/or address critical findings, but up to 20% of the sampled bridges have POA deficiencies lessening their effectiveness.
- All bridges are monitored in accordance with the POA, as appropriate, but minor deficiencies in documentation 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 Metric 18 ART Report (MAR18) to resolve all unevaluated bridges.
- Assess based on previous review results and the reviewer’s knowledge and awareness of the State’s identification of scour critical bridges, the status of POAs, and monitoring in accordance with the POAs.

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

- Randomly sample using Intermediate criteria.
- Review sample scour critical bridge files to verify that a scour evaluation exists and POAs are developed and implemented.
- If a recent potential triggering event(s) has occurred to a sample bridge, review files to verify that monitoring occurred in accordance with POA.
- Include site visits of some sample bridges in the field review sample for Metric 12 and 22.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample using In-depth criteria.
- Verify through interviews and site visits to some of the sampled scour critical bridges that monitoring procedures and POAs have been implemented.

Population: This metric applies to bridges evaluated as scour critical, those that are scour vulnerable, tidal, or have unknown foundations. Criteria used:

Metric #18 – Scour critical bridge: NBI Item 113 < 4, or 6, U, T, or null

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.

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 are intended to represent minor or isolated situations. POAs with major or significant shortcomings which render them useless for mitigating scour risks should be considered as NC findings.

Assessment levels: The process for determining the number and selection of sample bridges for inclusion in the field review sample for Metric 12 and 22 is covered in the Field Review Guidance section of this document.

Identified issues in the MAR18 are those which have been coded as 6, 3 or less, or U in Item 113 – Scour Critical Bridges. The resolution of these items at the Min-AL is to verify that those needing to be evaluated for scour vulnerability (code of 6/ T/ null), are being investigated to resolve these situations. Those newly coded as scour critical (code of 3 or less) should be verified to ensure that POAs have been developed and implemented. Independent verification of the POAs is accomplished at the Intermediate and In-depth levels.

InD-AL interviews should be of those personnel directly tasked with monitoring and follow-up responsibilities in accordance with the POAs. A POA is implemented when those responsible for actions under the plan are aware of their responsibilities, and are exercising them when called for during or after a triggering event. This may include local agency personnel.

Metric 18 ART Report (MAR18): The MAR18 includes all bridges over waterways for the metric population, and is based on the most recent and previous April NBI submissions. The MAR18 can also be run from the UPACS NBI reports page in Staffnet.

The MAR18 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 has an indicator showing whether a POA is required (bridge is scour critical or has an unknown foundation).

For all assessment levels, the status of the bridges shown 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 your review.

Background/ changes for PY 2014: *The population to be used for sampling has been added. A definition for substantial compliance has been added. The Commentary section was added to give more guidance and specific insight into the intent of the metric. The metric has been reformatted for improved clarity.*

NBIS Reference: 23 CFR 650.313 (f) – Complex bridges

Criteria

- Complex bridges have the following identified:
 - Specialized inspection procedures which clearly identify the complex features, specify the frequency of inspection of those features, describe any specific risk factors unique to the bridge, and clearly detail inspection methods and equipment to be employed.
 - Additional inspector training and experience required to inspect complex bridges.
- Complex bridges are inspected according to those procedures.

Population: Bridges for the entire State or selected geographic/owner subset that are complex bridge types.

Compliance Levels

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

- All complex bridges have specialized written inspection procedures and have any required additional inspector training and experience identified.
- All 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 complex bridges have specialized written inspection procedures and have additional inspector training and experience requirements.
- At least 90% of 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 bridges identified as complex using Intermediate criteria.
- Verify that sample bridge files identify specialized inspection procedures, and training and experience, and that the additional training or experience has been met by the inspectors.
- Include site visits of sample bridges in the field review sample for Metric 12 and 22.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges using In-depth criteria.
- Observe some complex bridge inspections being conducted to ensure specialized procedures are being followed.
- Review NBI bridge data to check independently if any bridges, currently not identified as complex, may in fact be.

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, which should result in thorough inspections yielding accurate condition assessments.

Specific risk factors include, but are not limited to:

- complex structural response
- difficult 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. States have the flexibility to define additional bridges that they consider to be complex because of unusual characteristics. If additional bridge types are considered complex, include them in the population.

Compliance levels: Acceptable *specialized written inspection procedures* are those procedures required in the NBIS for specific types of more complex inspections, in this case for complex bridges, to address those items that need to be communicated to the inspection team leader to insure 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 Manual (MBE), Section 4, has general considerations regarding inspection plans.

An owner may have general inspection procedures in their bridge inspection manual which 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, many times as an introductory section, and this is certainly an acceptable practice.

Assessment levels: The process for determining the number and selection of sample bridges for inclusion in the field review sample for Metric 12 and 22 is covered in the *Field Review Guidance* section of this document.

The reviewer should, for those bridges selected from this metric for field review, look for any evidence of risk factors or unique circumstances or conditions at each site. Then evaluate whether the inspection procedures developed for these bridges adequately address these items, and also whether the inspection reports adequately address them, as appropriate.

Bridges sampled, but not field reviewed, should have the inspection procedures and the inspection reports evaluated likewise, but with no field assessment in this case an alternative might be comparing with the bridge plans.

Background/ changes for PY 2014: Risk is incorporated into this metric by reviewing the risk items associated with complex bridges. This change coincides with a change to reduce the substantial compliance threshold percentage used in the 2011 metrics baseline. The issue is how and where can the risk we are most concerned about best be identified, its impact to the bridge and the program be assessed. The risk associated with complex bridges is assessed by looking at the bridge, examining whether the developed inspection procedures are adequate, and if the report documents a thorough inspection was done in accordance with the prescribed procedures.

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.



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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 and implemented.
- Procedures include periodic field review of inspection teams, periodic refresher training requirements, and independent review of inspection reports, computations, and NBI data.

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

- QC/QA procedures are established and implemented, but minor aspects of the procedures are not documented or are not being performed.
- Procedures include periodic field review of inspection teams, periodic refresher training requirements, and independent review of inspection reports, and computations, & NBI data.

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:

- Verify that the key components of the QC/QA procedures meet the requirements of the NBIS.
- Verify that a process exists to document the QC/QA procedures and confirm that the process is being followed.
- Review documentation of QA reviews for number of reviews, types of reviews and findings; verify that any measurable review requirements have been achieved.
- Review whether the procedure is maintaining a high degree of accuracy and consistency by considering follow-up actions to the QA findings and the results of the other metrics.
- Perform some interviews of personnel responsible for QC and/or QA reviews.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Participate in some QC or QA reviews to ensure established procedures are being followed.

General: This metric evaluates if the QC/QA process meets the intent of the NBIS, verifies that the reviews are performed and review results are used to maintain a high degree of accuracy and consistency in the inspection program.

Population: A population was not defined for this metric as there many different methods and requirements in which Agencies perform QC/QA 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: *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.

FHWA's recommended QC/QA framework can be found at:

<http://www.fhwa.dot.gov/bridge/nbis/nbisframework.cfm>.

Verify that the established criteria exists for refresher training as part of this metric. The review for adherence to the established criteria by the program manager and team leaders is to be evaluated as part of Metrics 2 and 3, respectively.

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 or QA process are not being performed, but the overall effectiveness is not impacted, this would be considered substantial compliance. An example of *minor aspects* would be isolated cases where a QC or QA check which was performed, but the 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.

The Int-AL reviews documented procedures for performing QC/QA of inspections, NBI data, and calculations to verify compliance with the NBIS. Verify that procedures address the QC/QA of consultants and/or other agencies that are performing inspections or calculations. A process should be in place 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. Interview some 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.

The InD-AL includes the Int-AL and participation in some QC and/or QA reviews. Interview those responsible for QC/QA roles in each major program component- inspections, load ratings, scour evaluations, and data. Interviews should cover each program component, but not necessarily every person tasked with QC/QA responsibilities.

***Background/ changes for PY 2014:** This metric was revised to better determine if the QC/QA program meets the intent of the NBIS, verify that reviews are performed and review results are used to maintain a high degree of accuracy and consistency in the inspection program. Clarification was added that compliance with periodic refresher training is be evaluated in Metric 2 and 3. The use of random sampling was eliminated because of the high degree of variance in the way the QC/QA program is administered.*

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.



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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 as having an unresolved active critical finding at the time of the last assessment and any 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.
- The period for FHWA notification of actions taken is established and followed.
- All critical findings are addressed and documented in accordance with the procedure.

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; timeframes for addressing critical findings are not clearly defined.
- The period for FHWA notification of actions taken is established; isolated instances where FHWA has not been notified of a critical finding have occurred.
- All critical findings are addressed in accordance with the procedure; isolated instances exist where documentation of actions taken is incomplete.

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 all critical findings have been addressed.
- Assess based on previous review results and the reviewer’s knowledge and awareness of the State’s process for addressing critical findings and that the process is being followed.

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 using Int-AL criteria to ensure actions taken and documentation were in accordance with the established procedure.
- Include site visits of some sample bridges in the field review sample for Metric 12 and 22.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample bridges using in-depth sampling criteria.
- Field review some or all sample bridges independently from M12 & 22.
- Investigate if other critical findings occurred which were not reported.

Population: The bridges identified for this population should be taken from the periodic reporting of critical findings submitted to FHWA; this includes critical findings which occurred on bridges owned by local or other agencies.

Compliance levels: *Timely* is defined for this metric as the timeframe established in the State's procedure for addressing critical findings.

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 substantial compliance.

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 such things as missing documentation for completed work or failure to close out the critical finding after work is completed.

The maximum suggested interval for *FHWA notification* is three-months.

If the reviewer becomes aware of an isolated instance where a critical finding was not reported to them in accordance to the policy, this should be considered substantial compliance. It is not expected that the reviewer investigate for possible omissions, unless performing an in-depth AL. At the in-depth AL, use the internet, news sources, emergency relief lists, local knowledge, discussions with an agency, etc., to determine if the list of critical findings is complete, or if other incidents should have been reported.

Assessment levels: The process for determining the number and selection of sample bridges for inclusion in the field review sample for Metric 12 and 22 is covered in the Field Review Guidance section of this document.

At the Min-AL, monitor the notifications from the State to verify that critical findings are addressed. This should typically be done throughout the year when the notification is received. If it becomes apparent that 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.

When performing the review for this metric, consider how critical findings are monitored for bridges owned by local agencies, and if necessary, addresses safety issues which are not being properly addressed by the owner. If an Agency has a conservative definition of a critical finding, the reviewer should coordinate or develop a process with the agency to identify which critical finding meets the NBIS definition of a critical finding (structural or safety related deficiency that requires immediate follow-up inspection or action) and only include those critical findings which meet the NBIS criteria.

An example of this would be an agency that identifies a critical finding as the condition code for SI&A items 58, 59, or 60 of a 4 or less. It may be that the identified deficiency does not rise to the level of the intent of the NBIS. In this case, the reviewer should coordinate or develop a process with the State to identify which critical finding meets the NBIS definition of a critical finding (structural or safety related deficiency that requires immediate follow-up inspection or action) and only include those critical findings which meet the NBIS criteria.

An example of this would be an agency that identifies a critical finding as the condition code for SI&A items 58, 59, or 60 of a 4 or less. It may be that the identified deficiency does not rise to the level of the intent of the NBIS. In this case the reviewer should use judgment, in consultation with

the State. The following Policy and Guidance Center - NBIS Non Regulatory Supplement [link](#) provides some guidance on the topic of critical findings:

<http://www.fhwa.dot.gov/bridge/0650csup.cfm>

If it is determined that the critical finding for a bridge does not meet the intent of the NBIS regulation, it can be removed from the population. This is done in an effort to not deter an agency from having a conservative procedure to address deficiencies and to focus FHWA's review on the regulatory intent of critical findings.

Conversely, the definition of a critical finding should envelope the following two NBI submission Safety Related Checks:

- (1) Item 64 less than 2.7 metric tons, and item 41 = A, B, P, or R, and item 103 is blank.
- (2) Any bridge with item 59 and/or item 60 coded less than 2, and item 41 = A, B, D, P or R, and item 103 is blank.

Background/ changes for PY 2014: *This metric has been revised to eliminate the allowable tolerance for non-NHS critical finding not being addressed, and to clarify how to assess when the State has a conservative critical finding definition.*

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.



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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: All bridges randomly sampled for Metrics 13 through 19, and 21.

Compliance Levels

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

- At least 95% of the inventory items reviewed are within the acceptable tolerances.
- All identified items not within the acceptable tolerances have been corrected.
- 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 inventory items reviewed are within the acceptable tolerances.
- No errors identified in the persistent error check, all other errors identified in the other FHWA data checks are resolved in 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 of a minimum of 20 selected bridges.
- Verify NBI SI&A items with information in the bridge file and actual field conditions for the 15 SI&A items identified on the Field Review Form.
- Review the safety related checks and persistent error reports generated during the NBI submittal process.

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 10 SI&A items from the list of 60 SI&A items selected by the reviewer based on their knowledge and awareness of the program.

In-Depth Assessment (InD-AL): In addition to the Min-AL, perform at least one of the following:

- Verify NBI SI&A items with information in the bridge file and actual field conditions for an additional 20 SI&A items from the list of 60 SI&A items selected by the reviewer based on their knowledge and awareness of the program.
- Perform Int-AL review on 30 bridges.

General: Metric 22 assesses the quality of NBI data. The data is reviewed and compared to the actual site conditions observed by the reviewer during the field reviews. Note that Metric 12 is also assessed during every field review. Metric 12 focuses on the four main condition codes 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 should be corrected.

Acceptable Tolerance is defined as 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 are to be used in assessing compliance.

FHWA data checks are processed during the annual NBI submittal and sent to the Division and State by the National Bridge Inventory Specialist 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 less than 2.7 metric tons, and item 41 = A, B, P, or R, and item 103 is blank; and
 - b. Any bridge with item 59 and/or item 60 coded less than 2, and 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 three-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. These instances should not be counted 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 posting (Item 64 between 2.7 and 19.9 mT or Item 41 = 'B') are assessed under Metric 14 and must be corrected for the subsequent annual NBI submittal.

Population: The process for identifying bridges to be reviewed for this metric is further explained in the Field Review Guidance in Chapter 2 of the Bridge Program Manual.

Compliance levels: For C, all data items found to be outside the acceptable tolerance must be resolved and corrected, even though at least 95% of the items are coded within the acceptable tolerances. Until all items are corrected, the appropriate compliance determination is SC.

Where an item is being systematically miscoded, the underlying issue behind that problem must be corrected.

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, 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 items coded within tolerance

$260/270 * 100 = 96\%$ coded within tolerance

In this example, if the items which exceeded the allowable tolerance were isolated instances and the items were corrected, this would be considered C. If any of the miscoded items is a systematic problem which occurs beyond the field reviewed bridges, the underlying issue and the data for all bridges must be corrected before a determination of C can be assigned. Until the time in which the items are correct, the appropriate compliance determination would be SC.

Assessment levels: The NBIP Field Review Checklist identifies 15 items which are to be reviewed at the Min-AL for each field reviewed bridge.

At the Int-AL, include the 15 items identified at the Min-AL and 10 additional items. The 10 items are to be selected from the additional list of 60 SI&A items identified in the NBIP Field Review Form. Knowledge of the program should be used in making this selection.

At the InD-AL, include the 15 items identified at the Min-AL and 20 additional items. The 20 items are to be selected from the additional list of 60 SI&A items identified in the NBIP Field Review Form. Knowledge of the program should be used in making this selection.

During the field review of each bridge, verify that the NBI data which is reported to FHWA is properly coded and reflects what is present in the field. If an item cannot be verified in the field, compare NBI data with available information in the bridge record components. An example of an item which 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 immediately.

Do not to jeopardize safety when field verifying NBI data. If additional resources (lane closures, flaggers, etc.) are needed to safely verify actual field measurements, use judgment with partial or nearby measurements to determine if the actual measurements appear reasonable. For example,

measure the vertical underclearance in the shoulder area of a busy roadway so that it can be compared to Item 54 to determine if it is reasonable.

Background/ changes for PY 2014: *The metric has been reformatted for improved clarity.*

Background/ changes for 2012: *The changes to this metric were implemented to improve the method used by the NBIP assessment process to assess the quality of the NBI data. A standardized field review checklist is now provided which will improve FHWA's consistency of the field review. Sampling and assessments for this metric were changed to recognize that this metric can only be meaningfully assessed by reviewing bridges in the field, and also acknowledging the annual NBIP review expectation that a minimum number of field reviews are to be performed each year.*

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 or selected geographic/owner.

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 is able to verify SI&A data is updated in the State inventory within 90/180 days.
- SI&A data 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 is not able to verify SI&A data is updated in the State inventory within 90/180 days
- At least 90% of SI&A data 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:

- Review bridges identified as overdue in the Metric 6-10 ART reports and determine if SI&A data was updated within the 90/180 day timeframes.
- 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.

In-Depth Assessment (InD-AL): In addition to the Int-AL:

- Randomly sample using In-depth criteria to assess if SI&A data is updated in the State’s inventory within the 90/180 day timeframes.

General: The 90/180 day requirement for updating SI&A data refers to data entered into the State inventory. It is expected that updated SI&A data is available in a central location for submittal to FHWA upon request.

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 the following address <http://www.fhwa.dot.gov/bridge/nbi.htm>.

If an extremely unusual circumstance arises and the State is requesting a time extension beyond the identified submittal date, the Division is to coordinate with the National Bridge Inventory Specialist in the Office of Bridge Technology to determine if a time extension is acceptable and to establish a revised submittal date.

Compliance with the 90/180 day timeframes – at the intermediate level, the intent of *assess how State is able to determine if bridge SI&A data is updated in the 90/180 day timeframes* is to determine if the State has the ability to verify that data is being updated into the State inventory within 90/180 days after inspection, modification or changes in load restrictions. This would typically be done by interviewing the person responsible for managing the data or review of procedures. If it is determined through this process that the timeframes cannot be verified, this would be considered substantial compliance and an improvement plan should be developed.

At the intermediate level, if bridges are identified as “overdue” on the summary page of the Metric 6-10 ART Reports, review the reason for being overdue. If it is determined that the bridge was inspected on time, but the data was not entered into the State inventory, this is an indication that inspection data was likely not updated in the 90/180 day timeframes. The Metric 6-10 ART Reports allow for 120/210 days (90/180 days to update data and an additional 30 days to compile the April NBI submission) before identifying it as overdue.

At the in-depth level, perform a random sample of bridges, and verify that inspection data has been updated within the 90/180 timeframes.

Background/ changes for PY 2014: *This metric has been updated to assess whether the SI&A data is submitted to the FHWA NBI in a timely manner and includes a process to assess timeliness of updating SI&A data.*

The metric has been reformatted for improved clarity. The Commentary section was added to give further guidance and more specific insight into the intent of the metric.