U.S. Department of Transportation
Federal Highway Administration

Alaska Division

January 5, 2023

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In Reply Refer To:
NBIP23-PCA13

Mr. Ryan Anderson, P.E.
Commissioner
Alaska Department of Transportation and Public Facilities
P.O. Box 112500
3132 Channel Drive
Juneau, AK 99811-2500

Attention: Ms. Leslie Daugherty, P.E., Chief Bridge Engineer

Subject: ***National Bridge Inspection Program (NBIP) Performance Year 2023 Notice of Noncompliance***

Dear Commissioner Anderson:

Our office recently conducted an annual review of your National Bridge Inspection Standards (NBIS) in accordance with 23 U.S.C. 144(h)(4)(A). This annual review is conducted to assess key areas of the bridge inspection program for compliance with Title 23 CFR 650 Subpart C - National Bridge Inspection Standards. Listed below are the areas of your program that are not in compliance with current regulations as noted in the Performance Year 2023 NBIS Annual Program Review Summary Report for your state. A copy of the findings is attached as reference.

In accordance with 23 U.S.C. 144(h)(4)(B), we are hereby providing formal notification of compliance deficiencies. These deficiencies must either be resolved, or a plan of corrective action must be submitted to our office for approval that addresses each deficiency listed by February 19, 2023 (45 calendar days from the date of this letter) in order to avoid the penalty provisions of 23 U.S.C. 144(h)(5). Specific deficiencies cited in the report include the following:

23 CFR 650.313(k) [formerly (c)] *Requires that bridges are rated for their safe load carrying capacity in accordance with the AASHTO Manual for Bridge Evaluation (MBE), for all legal vehicles and State routine permit loads*. The following findings are described in more detail in the attached Summary Report:

B13-1: Bridges have not been rated for all legal and State routine permit loads
B13-2: Not all load ratings, particularly operating ratings, conform to MBE procedures.

In order to avoid the penalty provisions, one of the following actions is required:

(1) Immediate correction of NBIS deficiencies, or
(2) Submission of an acceptable aggressive, short term plan of corrective action in accordance with the guidelines, for approval by the FHWA, to correct NBIS deficiencies.

An acceptable plan of corrective action shall be one which accomplishes NBIS compliance within the minimum practicable time frame; typical acceptable timeframes in the past have been two years or less.

We trust that this notification clearly indicates deficient areas relevant to Title 23 CFR 650 Subpart C and the associated penalty provisions implications if action is not taken to correct these deficiencies. Please feel free to contact Peter Forsling, Bridge Engineer, at Peter.Forsling@dot.gov or 907-586-7427 if you have any questions or would like to discuss these issues.

Sincerely,

Sandra A. Garcia-Aline
Division Administrator

Enclosure: NBIS Annual Program Review Summary Report-Performance Year 2023

cc: Leslie Daugherty, P.E., Chief Bridge Engineer, DOT & PF
Gerald Varney, Deputy Division Administrator, FHWA AK Division
Emily Haynes, Field Operations Team Lead, FHWA AK Division
Peter Forsling, Bridge Engineer, FHWA AK Division

U.S. Department of Transportation

Federal Highway Administration

Summary Report

FHWA Alaska Division

NBIS Annual Program Review

January 4, 2023

U.S. Department of Transportation
Federal Highway Administration

Table of Contents

U.S. Department of Transportation
Federal Highway Administration

Executive Summary

The Calendar Year 2022/Performance Year 2023 National Bridge Inspection Program (NBIP) review of 23 individual metrics found the State of Alaska to be fully compliant on twenty metrics, substantially compliant on metrics B16 (Fracture Critical/Nonredundant Steel Tension Member Inspection Procedures) and B01 (Bridge Inspection Organization), and noncompliant on metric B13 (Load Rating).

The noncompliance finding on B13 reflects that not all legal loads are being rated for, and some aspects of load ratings do not conform to NBI and AASHTO Manual for Bridge Evaluation (MBE) standards of procedure.

Substantial compliance on metric B01 accounts for the likely need for additional staff or support to aggressively deal with the noncompliance on metric B13.

Substantial compliance in the case of metric B16 reflects minor inconsistencies in the required reports, which need to be addressed but do not impact safety for the traveling public.

Metric B01 Bridge Inspection Organization

Extent of Review

No PCA is in effect. The Reviewer:

- Verified that responsibility for the NBIS is assigned to a Bridge Inspection Program Manager (PM), and that documented organizational roles, responsibilities, and delegation procedures exist as applicable.
- Assessed the effectiveness of delegated functions.
- Interviewed the PM to assess the overall effectiveness of the organization and interview of PM.
- Assessment also based on assessment of other metrics, previous review results, and the reviewer's knowledge and awareness of the bridge inspection program.

Populations and Samples

Population Description Bridges with FCMs in the Northern Region
Data Source NBI data, inspection reports and site visits.

Population Size: 38
Sample Size: 17
Field Reviewed: 4
File Reviewed: 17
Interviewed: 1

Observations

23 CFR 650.307 requires a bridge inspection organization with the capacity to carry out the NBI requirements be in place and functioning effectively.

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

The organization is in place. Responsibility for the NBIS is assigned to a PM, Mr. Larry Owen, P.E., and his responsibilities are clearly defined both by the NBIS and by the Alaska Bridges and Structures Manual (BSM). Few functions are delegated, though the PM is also a team leader and as such can assign load ratings, special inspections and other tasks to members of his team. Insofar as members of bridge design teams are responsible for producing load ratings for the new bridges they design, he can advise and direct them on the technical aspects of this work. As all staff in Bridge Section participate in routine inspections, he also leads the technical aspects of those efforts; more discussion is included in the Metric B20 discussion of QC/QA. The process

appears to be effective based in particular on the results of Metrics B12 and B20, which assess the inspection results.

Findings No findings rising to the level of noncompliance.
Conclusions The State is Substantially Compliant on this metric.
Recommendations
Review whether additional staff are required to be hired or reassigned or whether consultants should be retained to aggressively address the noncompliance findings of Metrics B13 and B14.
December 31 Compliance: Substantially Compliant
Summary Complete: Yes

Metric B02 Qualifications of Personnel Program Manager

Extent of Review

No PCA is in effect. Assessment is based on previous review results, past documentation, a downloaded current State PE list, the current list of Team Leaders maintained by the Alaska DOT&PF, and on the reviewer's knowledge and awareness of the PM's qualifications.

Observations

For compliance, The Program Manager (PM) must have the following qualifications:

- Professional engineer (PE) registration or 10 years of bridge inspection experience;
- Successful completion of FHWA approved comprehensive bridge inspection training; and
- Completion of periodic bridge inspection refresher training according to State policy.

The PM is a PE with the required comprehensive and refresher training, and meets the qualifications.

Findings

No compliance issues found.

Conclusions

The State is Compliant on this metric.

Recommendations

None

December 31 Compliance: Compliant
Summary Complete: Yes

Metric B03 Qualifications of Personnel Team Leader(s)

Extent of Review

No PCA is in effect. No MAR Report exists for this metric. Assessment is based on previous review results, past documentation, a downloaded current State PE list, the current list of Team Leaders maintained by the Alaska DOT&PF, and on the reviewer's knowledge and awareness of the process for monitoring TL qualifications.

Observations

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

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

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

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

All TLS were found to be qualified per the State's current list.

Findings No compliance issues found.

Conclusions The State is Compliant on this metric.
Recommendations None.
December 31 Compliance: Compliant
Summary Complete: Yes

Metric B04 Qualifications of Personnel Load Rating Engineer

Extent of Review

No MAR Report exists for this metric. No PCA is in effect. Assessment is based on previous review results, past documentation, a downloaded current State PE list, the current list of Team Leaders maintained by the Alaska DOT&PF, and on the reviewer's knowledge and awareness of the identity, responsibilities, and qualifications of the Load Rating Engineer (LRE).

Observations

The PM (evaluated in metric 2) also serves as the Load Rating Engineer (LRE) and has overall responsibility for load rating of bridges and is a registered professional engineer. This meets the criteria.

Findings

No compliance issues found.

Conclusions

The State is Compliant on this metric.

Recommendations

None.

December 31 Compliance: Compliant
Summary Complete: Yes

Metric B05 Qualifications of Personnel UW Bridge Inspection Diver

Extent of Review
No MAR Report exists for this metric. No PCA is in effect. Assessed based on previous review results and on the reviewer's knowledge and awareness of the State's process for monitoring underwater bridge inspection diver qualifications.

Observations
No changes in process of specifying qualifications in contracting requirements. Prior reviews have demonstrated compliance.

Findings
No compliance issues found.

Conclusions
The State is Compliant on this metric.

Recommendations
None.

December 31 Compliance: Compliant

Summary Complete: Yes

Metric B06 Inspection Frequency Routine - Lower Risk Bridges

Extent of Review

Criterion: Routine inspections for lower risk bridges are performed at regular intervals not to exceed (NTE) 24 months, or NTE 48 months when adhering to FHWA approved criteria.

No PCA in effect. Reviewed the MAR 06 report, revised the spreadsheet to reflect the State's responses, and also assessed based on previous review results and the reviewer's personal knowledge and awareness.

MAR Resolved

Yes

If No or N/A, explain:

Observations

All non-Federal NBI bridges were inspected on time.

Findings

No compliance issues found.

Conclusions

The State is Compliant on this metric.

Recommendations

None.

December 31 Compliance: Compliant

Summary Complete: Yes

Metric B07 Inspection Frequency Routine - Higher Risk Bridges

Extent of Review

No PCA. Resolved MAR report. Otherwise, based assessment on the resolved report snapshot, prior review results, and the reviewer's personal knowledge and awareness.

MAR Resolved

Yes

If No or N/A, explain:

Observations

All non-Federal NBI bridges were inspected on time.

Findings

No non-compliance issues found.

Conclusions

The State is Compliant on this metric.

Recommendations

None.

December 31 Compliance: Compliant

Summary Complete: Yes

Metric B08 Inspection Frequency Underwater - Lower Risk Bridges

Extent of Review

Resolved MAR08 and used the resolved snapshot, previous review results and the reviewer's personal knowledge and awareness to assess compliance.

MAR Resolved

Yes

If No or N/A, explain:

Observations

Criterion for Compliance: 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.

There was a bridge which has been inspected recently, but the prior interval was 64 months.

Findings

No non-compliance findings at this level of assessment.

Conclusions

The State is compliant on this metric.

Recommendations

Keep a keen eye on the inspection schedule for these long-interval inspections.

December 31 Compliance: Compliant

Summary Complete: Yes

Metric B09 Inspection Frequency Underwater - Higher Risk Bridges

Extent of Review

No PCA. Resolved MAR report. Otherwise, based assessment on the resolved report snapshot, prior review results, and the reviewer's personal knowledge and awareness.

MAR Resolved

Yes

If No or N/A, explain:

Observations

23 CFR 650.311 (b) requires underwater (UW) inspections to be performed at intervals NTE 60 months; if the condition of portions of the bridge which are underwater cannot be inspected to the mudline in a low-water inspection, divers must be used. In rare cases, bridges may be in locations which are chronically unsafe to dive.

There was a bridge which has been inspected recently, but the prior interval was 61 months.

Findings

No noncompliance findings.

Conclusions

The State is compliant on this metric.

Recommendations

Keep a keen eye on the schedule for these inspections.

December 31 Compliance: Compliant

Summary Complete: Yes

Metric B10 Inspection Frequency Fracture Critical Member

Extent of Review
No PCA is in effect, the review was performed based on the MAR10 report and the reviewer's personal knowledge of the program.

MAR Resolved
Yes
If No or N/A, explain:

Observations
23 CFR 650.311 (c) has required fracture critical or non-redundant steel tension members (FCMs/NSTMs) to be inspected with an interval not to exceed the time specified.
The MAR10 report indicated two bridges which have been replaced and no longer have FCMs/NSTMs, but no delay of NSTM bridge inspections.

Findings
No non-compliance findings.

Conclusions
The State is compliant on this metric.

Recommendations
None.

December 31 Compliance: Compliant
Summary Complete: Yes

Metric B11 Inspection Frequency Frequency Criteria

Extent of Review
No PCA is in effect for this metric. The review was based on information in the MAR11 report and the reviewer's personal knowledge and awareness of the program.

MAR Resolved
N/A
If No or N/A, explain:
MAR11 is informational only. Further, it showed no compliance issues.

Observations
MAR11 showed no compliance issues. The State does not use fixed-length reduced frequency inspections. For routine, fracture-critical (NSTM), or underwater inspections where the inspection interval should be reduced, this is driven by inspection findings, the bridge operating environment (including traffic volume and freight considerations), and engineering factors. The last time the reviewer can recall such a case would be about a decade ago, and the bridges were replaced.

Findings
No noncompliance findings.

Conclusions
The State is compliant on this metric.

Recommendations
None.

December 31 Compliance: Compliant
Summary Complete: Yes

Metric B12 Inspection Procedures Quality Inspections

Extent of Review

No PCA is in effect. Performed field reviews of bridges sampled at a LOC 80%, MOE 15% size or greater, to compare inspection reports for all appropriate inspection types with actual bridge conditions to evaluate:
1) Accuracy of component condition codes;
2) Use of MBE procedures;
3) Adequacy of documentation and appropriate justification of component condition ratings;
4) Indication that a qualified team leader was present at each applicable inspection, and qualified divers for underwater inspections.

Populations and Samples

Population Description Northern Region bridges
Data Source NBI

Population Size: 303
Sample Size: 18
Field Reviewed: 18
File Reviewed:
Interviewed:

Observations

23 CFR 650.313 (a) & (b) require quality inspections conforming to AASHTO MBE inspection procedures and providing for the use of advanced technologies in accordance with the BIRM, as applicable.
For Compliance (C): All of the following must be met for C:
• At least 90% of bridges reviewed meet the criteria for component condition ratings, documentation of deficiencies, and following of applicable MBE procedures.
• All bridges reviewed had a qualified team leader on site during all most recent inspection types.
Site visits and review of the corresponding most recent inspections at all 18 bridges (100%) confirmed the results of the inspections to be in conformity with the results expected from following prescribed procedures.

Findings No noncompliance findings.
Conclusions The State is in Compliance with this metric.
Recommendations Continue with this long tradition of excellent inspections!
December 31 Compliance: Compliant
Summary Complete: Yes

Metric B13 Inspection Procedures Load Rating

Extent of Review

No PCA was in effect; the MAR13 report was reviewed, load rating calculations for a sample of bridges were independently checked for compliance deficiencies, and to verify that all legal vehicles were considered, and load ratings are consistent with current conditions. Further, some bridges from this sample were included in the metric B12/B22 field review to compare actual field conditions with those identified for use in the load rating. Review of this metric at the Int-AL level was previously performed during this 5-year cycle, in CY2017/PY18. A team of FHWA and Alaska DOT&PF personnel conferred on this assessment as the work progressed. The sample included a random-driven selection of nineteen bridges drawn from the Statewide population which were NOT open without restriction (NBI Item 41 was other than "A"), and a selection of seven bridges along a route heavily used for trucking with load ratings lower than typical values.

MAR Resolved

Yes
If No or N/A, explain:

Observations

23 CFR 650.313 (c) Requires each bridge to be rated for its safe load-carrying capacity.
In the typical In-Depth Assessment of this metric, the following expectations would be to cover all steps performed for the Minimal and Intermediate Assessment Levels and any additional investigation. This would include, for Min-AL, that any PCA in effect would be monitored, the MAR13 report would be reviewed and any load rating compliance deficiencies resolved, and a random sample of bridges be selected and their load ratings reviewed to verify that load rating calculations or documented determinations exist, all legal vehicles were considered, and load ratings are consistent with current conditions. Further, some bridges from this random sample would be included in the metric B12/B22 field review to compare actual field conditions with those identified for use in the load rating. Review of this metric at the Int-AL level was previously performed during this 5-year cycle, in CY2017/PY18.
The impetus for an In-Depth Assessment came as the result of the reviewer's increased exposure to Alaska's unique Federal Vehicle Size & Weight regulatory environment for highway loads. Federal regulations for the National Network for trucks, including all Interstate Routes, are contained in 23 CFR Part 658 and detail the length, width, and gross vehicle weight (GVW) restrictions for trucks on this network of highways. On the Interstates, GVW is limited to 80,000 pounds (lbs). This convention implicitly underlies the AASHTO load rating vehicles discussed in the AASHTO Manual for Bridge Evaluation (MBE) and used for at least three decades by the Alaska DOT&PF in their

procedures for the load rating of bridges. In Alaska, however, Appendix C to Part 658 explicitly states that no highways in the State are subject to the Interstate weight limits, but leaves intact restrictions from State law, and regulatory overall length, axle spacing, single axle loading, and axle group loading restrictions.

Findings

There were two groups of compliance findings for metric B13, as described below:

B13-1) Not all legal loads have been rated for. Alaska allows longer vehicles with heavier axle loads than other States. Annual permits are routinely issued by MS&CVC for use on bridges which are not posted, without contacting Bridge Section. Bridge Section rates for legal loads and for annual and special permit loads above 125% of legal loads on a user-route basis. An Alaska Analysis performed in 1993 seems to be the closest Bridge Section has come to performing an envelope analysis, and it is not clear that that was the purpose of the 1993 analysis. The rating vehicles used in load rating Alaska's NBI bridges likely do not envelope the following:

a) Loads on designated Alaska Interstate routes which conform to State legal limits but exceed the 80,000 lb Interstate GVW limit (there is no GVW limit on Alaska's designated Interstate routes).

b) The posting analysis is typically based on scaling the controlling rating factor of the design load (typically HS20), using the load effect ratios between the legal loads under consideration and the design load. Actual loads which meet Alaska legal axle and axle group requirements, often have load distributions differing from the load rating vehicles being used.

c) Vehicles from legal loads up to 125% of State legal loads.

d) While the 2022 revision of the NBIS is relatively new, there are requirements for the State to establish criteria for reduced inspection intervals, and included among these is a consideration of the loads which bridges may be subjected to.

B13-2) Rating practices seem to deviate from the NBIS/MBE requirements. For example:

a) No impact load is used for operating rating

b) Single lane loading is used for the operating rating. This may have arisen from DOT&PF interpretation of seeming ambiguity in the language for the requirements:

i) For Load Factor (LF) Rating, MBE 6B.2.2 states, "Load ratings based on the operating rating level generally describe the maximum permissible live load to which the structure may be subjected. Allowing unlimited numbers of vehicles to use the bridge at operating level may shorten the life of the bridge." This cautionary language is supportive of posting at inventory level rather than operating level.

ii) The requirement under Load and Resistance Factor Rating (LRFR), is stated in 6A.5.11.4 as "For operating rating of the design load at the service limit state, the number of live load lanes may be taken as the number of striped lanes. However, loads shall be positioned so as to create maximum effects, for example, on shoulders if necessary."

iii) For LRFR, the MBE commentary in C6A.5.11.4 is clearer; "The use of the number

of striped lanes is an attempt to “calibrate” the service limit states and distinguishes the operating rating (where the number of striped lanes is used) from the inventory rating (where the number of design lanes is appropriately used).”
c) While a screening was done for gusset plates after the I-35W collapse, apparently not all truss members are rated.
d) Not all sections and locations are rated.
e) For prestressed concrete, no service limit states were rated. Per MBE 6B.5.5.3, ‘The rating of prestressed concrete members at both inventory and operating level should be established in accordance with the strength requirements of the AASHTO Standard Specifications. Additionally at inventory level, the rating must consider the allowable stresses at service load as specified in the AASHTO Standard Specifications.’
f) Calculations used the smaller of S/D and the lever rule, or sometimes the LRFD LLDF in LFR.

Conclusions

The State is not in compliance with NBI requirements on this metric. The State was notified by email to the Bridge Inspection Program Manager on 18 Nov 2022.

Recommendations

Recommendations to Resolve Compliance Findings are as follows for this metric:
DOT&PF must come up with a Plan of Corrective Action (PCA) which addresses all of the compliance findings in a programmatic way. Addressing individual findings in an ad hoc manner is not programmatic. Specific recommendations likely to lead to FHWA acceptance of the PCA are as follows:
B13-1) DOT&PF must perform load ratings that envelope all legal loads. An analytic or parametric study of this problem could obtain the necessary enveloping model load or loads for rating. The study would have to be performed thoroughly, but urgently.
B13-2) DOT&PF load ratings must conform to NBIS requirements, including MBE requirements. The PCA must include steps to identify inconsistencies between DOT&PF practices and MBE requirements, and steps to consistently address those and the issues raised in this review and listed in the “Observations Regarding Compliance” in the report for this metric [see attachment].

December 31 Compliance: Non-Compliant
Summary Complete: Yes

Metric B14 Inspection Procedures Post or Restrict

Extent of Review

Metric B14, like the other NBIP bridge metrics, is expected to be performed at an Intermediate Assessment Level at least once in a five-year cycle. Metric B14 has previously been assessed at the Intermediate Level during this five-year cycle, in CY2017/PY18. For this review, no PCA was in effect. The MAR14 report was reviewed with no issues identified, and the sample of bridges used for the metric B13 In-Depth review was applied to this metric. Some bridges from the B13/B14 metrics' sample were included in the Metric B12/B22 field review sample, to enable verification that posting signs exist and are appropriate for the current load rating and posting recommendations. Guidelines for the review were developed with concurrence from the BSE, and the review was conducted in accordance with the guidelines. The result of the load rating (metric B13) portion of the review made it impractical to proceed with the posting evaluation (metric B14) part of the review. This metric had previously been assessed at the Intermediate level during this five-year cycle.

MAR Resolved

Yes
If No or N/A, explain:

Observations

23 CFR 650.313 (c) Requires posting or restricting bridges when the maximum unrestricted legal loads or State routine permit loads exceed that allowed under the operating rating or equivalent rating factor.
For a typical In-Depth Assessment Level review, the expectation is that the steps performed for the Minimal and Intermediate Assessment Levels would be performed that year in addition to the further investigation raising the Assessment to the In-Depth Level. This would include: Monitoring any PCA in effect, reviewing the MAR14 report and notifying the State of posting deficiencies identified in MAR14 within 30 days of notification from the NBI administrator that the data has been accepted and resolve all posting deficiencies identified in MAR14. Further, the metric would be assessed based on a random sample of bridges requiring posting and a review of the bridge files to verify that the documentation shows posting is properly implemented and corresponds to the load rating recommendation. Some bridges from this metric's random sample would be included in the Metric B12/B22 field review sample, to verify that posting signs exist and are appropriate for the current load rating and posting recommendations. For the In-Depth portion, guidelines for the review would be developed with concurrence from BSE, and the review conducted in accordance with the guidelines.
Note that the requirement refers to "the operating rating or equivalent rating factor." The Inventory Rating of a bridge can be thought of as the load the bridge can safely convey (in an assumed configuration) an indefinite number of times, while the Operating Rating

is often thought of as the load a bridge could safely convey just once over the same bridge. Given that the Alaska DOT&PF posts to the Inventory Rating as the "equivalent rating factor," and this is more conservative in terms of preserving infrastructure, it can be assumed that there is an unquantified safety factor due to this more conservative practice presently being used, which works to some degree to mitigate safety concerns regarding the uncertainty of whether current rating practices represent all the truck loads legally allowed on Alaska's highways.

State Routine permit loads, as referred to in the requirement, allow 125% of the State legal loads to travel over non-posted bridges. It is not clear that the extra 25% loading is accounted for by the rating procedures, and therefore by the posting procedures.

Given that not all legal loads have been rated for, bridges may not be load posted or restricted when “the maximum unrestricted legal loads or State routine permit loads exceed those allowed under the operating rating or equivalent rating factor.”

It is not clear that posting thresholds are accurate and sufficient, especially since there are many legal load configurations with load distributions different from the rating vehicle (e.g., HS20), and even if scaling to HS20 were acceptable it isn’t clear that all legal loads and routine permit loads are accounted for in setting the posting threshold.

However, it is not clear that the sampled bridges were posted inaccurately.

Findings
No conclusive noncompliance finding on this metric.

Conclusions
The State is compliant with this metric.

Recommendations
Subsequent to being able to envelope or otherwise account for all legal loads (per the metric B13 PCA), DOT&PF must verify that postings statewide account for situations when “the maximum unrestricted legal loads or State routine permit loads exceed those allowed under the operating rating or equivalent rating factor.” An effective approach to this would be to prioritize the work, much like the successful approach followed in the recently completed Scour PCA.

December 31 Compliance: Compliant
Summary Complete: Yes

Metric B15 Inspection Procedures Bridge Files

Extent of Review

No PCA is in effect. Randomly sampled bridges to verify that bridge files and significant bridge file components exist; if some components are only referenced, verify the components exist in the referenced location(s) and are readily available. Also assessed based on previous review results and the reviewer's knowledge and awareness of State's practices.

Population Description All Alaska bridges (apparently inluding Federal)
Data Source NBI/Sampling Tool

Population Size: 1595
Sample Size: 19
Field Reviewed:
File Reviewed: 19
Interviewed:

Observations

23 CFR 650.313 (d) requires preparation and maintenance of bridge inspection files.
Compliance (C): All of the following must be met for C:
• All sampled bridges have files.
• All sampled files have the applicable significant components.
The "file system" includes, but is not limited to, filing cabinets with papers containing data. There is a large fire-resistant vault room with numerous file cabinets containing current inspection reports and bridge-specific data, a set of file cabinets for as-built bridge plans, and outside the vault there are file cabinets with hydraulic data for the State's bridges and another set with current and past load ratings. In addition, there is a computerized "eVault", acting as an electronic shared drive accessible to Bridge Section staff, containing well-organized data for the bridges, including electronic copies of (more recent) inspection reports, scour evaluations, load ratings, maintenance reports, studies, and other pertinent data related to specific NBI bridges. There are provisions for periodic backup of this data to a separate location to protect against its loss in the event of fire or other hazard occurring at the Headquarters Building at 3-Mile.

Findings No noncompliance findings.
Conclusions The State is compliant on this metric.
Recommendations

Continue backing up data, and scanning older documents into the eVault.

December 31 Compliance: Compliant
Summary Complete: Yes

Metric B16 Inspection Procedures Fracture Critical Members

Extent of Review

No PCA is in effect. Assessed based on a random sample of bridges to verify that sample FCM bridge files contain inspection procedures, and that the FCM inspection report indicates the bridge was inspected according to those procedures; some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify documented procedures were followed; and previous review results and the reviewer's knowledge and awareness of State's FCM inspection practices were used.

Populations and Samples

Population Description Bridges with FCMs in the Northern Region
Data Source NBI data, inspection reports and site visits.

Population Size: 38
Sample Size: 17
Field Reviewed: 4
File Reviewed: 17
Interviewed:

Observations

Some FC/NSTM inspections were combined with routine inspections in the case where small, simple structures did not require specialized equipment beyond that required for a routine inspection to provide a hands-on NSTM inspection. In some of these cases, no explicit FC/NSTM procedures were listed or NSTMs identified, but these were on simply-supported beams and the inspection teams were abundantly familiar with the behavior of such structures and the tension zones to be expected.

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

• All sampled bridges with FCMs have documented inspection procedures; the procedures may have minor or isolated deficiencies that do not adversely affect the effectiveness of the FCM inspections.

• All sampled bridges with FCMs are inspected according to those procedures.

Findings

No findings rising to the level of noncompliance.

Conclusions

The State is Substantially Compliant on this metric.

Recommendations

Review the format of the FC/NSTM inspections versus the format of the combined routine/FC/NSTM reports and consider whether changes are warranted.

December 31 Compliance: Substantially Compliant
Summary Complete: Yes

Metric B17 Inspection Procedures Underwater

Extent of Review

Used a random sample of bridges to verify that files contain UW inspection procedures, and the UW inspection reports showed that the bridge was inspected according to those procedures. Include some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify documented procedures were followed. No PCA was in effect; reviewer also based assessment on previous review results and reviewer's knowledge and awareness of the program.

Observations

23 CFR 650.313 (e)(2) – requires underwater (UW) inspections for bridges with underwater elements. For structures over tidal waterways or waters subject to seasonal ebbs and flows, condition inspection to mudline of underwater elements may sometimes be accomplished by low water inspection during routine inspection activities (some locations in Alaska have tidal elevation changes of over 30 feet). The Alaska DOT&PF performs underwater (UW) inspections primarily by means of consultant. To obtain qualifications-based bids to perform the inspections, DOT&PF issues a Request For Proposals (an RFP) which specifies the procedures governing the inspections generally, including the relevant parts of 23 CFR 650 Subpart C, which references the AASHTO MBE. The MBE in turn (especially 4.2.5.6—Underwater Inspection Procedures, 4.3.5.8.1—Substructure/Culvert Scour Inspection, and 4.3.5.8.2—Underwater Inspection) references the FHWA Bridge Inspection Reference Manual (BIRM), any bridge scour POA provisions relating to inspection, and diver qualifications in the context of OSHA regulations (29 CFR Part 1910, Subpart T—Commercial Diving Operations). None of the bridges in the sample appeared to require bridge-specific procedures beyond the uniformly applicable requirements; the reviewer has been to four of those sites in previous years, and has reviewed the reports for each.
For Compliance (C): All of the following must be met for C:
• All sampled bridges requiring UW inspection have documented inspection procedures.
• All sampled bridges requiring UW inspections are inspected according to those procedures.

Findings No noncompliance findings.
Conclusions The State is compliant on this metric.
Recommendations None.
December 31 Compliance: Compliant
Summary Complete: Yes

Metric B18 Inspection Procedures Scour Critical Bridges

Extent of Review

No PCA is in effect. The MAR18 Summary showed no issues. In addition:

- A random sample of bridges was selected for file review. Reviewer interviewed the State Hydraulics Engineer, who demonstrated their file (eVault) system's hydraulics data features to verify that scour evaluations are documented, consistent with bridge conditions, and properly assess scour vulnerability.
- Verified that their tiered Scour POA system (as approved by FHWA) is developed and documented to identify those bridges that are scour critical or have unknown foundations; the procedures for regional Maintenance and Operations (M&O) personnel and Incident Management officials to monitor and respond to flooding conditions are documented in their Incident Field Operations Guide (FOG), especially under Section 5, 'Emergency Maintenance'.
- Some bridges from this metric's random sample in the Metric 12 and 22 field review sample. Due to the use of deep (typically driven pile) foundations to provide stability under earthquake conditions, which typically control over scour protection requirements, the inability to field-verify pile tip elevations and the impracticality of performing computational modeling in a rental vehicle make the ability to verify validity of scour evaluations in the field dubious at best. However, channel assessments and erosion observed as deep below waterline as the lack of turbidity permits were consistent between the inspections and the site reviews.
- Interviewed the State Hydraulic Engineer regarding multiple triggering events in the past two years; none of the sampled bridges were affected by them, but verified that monitoring was executed in accordance with the POA and beyond its specific requirements.
- The metric was assessed additionally based on previous review results, the status of any new compliance deficiencies, and from the reviewer's knowledge and awareness of the State's processes and practices.

MAR Resolved Yes

Populations and Samples

Population Description Bridges over water (apparently incl. Federal in count)
Data Source NBI

Population Size: 1475
Sample Size: 19
Field Reviewed: 6
File Reviewed: 19
Interviewed:

Observations

23 CFR 650.313 (e), (e3) require inspections to identify bridges that are scour critical.

For Compliance (C): All of the following must be met for C:
• All bridges over water have a scour evaluation as indicated by NBI scour coding.
• All sampled bridges have a documented scour evaluation assessing scour vulnerability.
• All sampled bridges that are scour critical or with unknown foundations have a scour POA.
• All sampled bridges subject to a triggering event are monitored in accordance with the POA.
The State has procedures in place, and follows them. The tiered POA, approved by FHWA, does not contain individualized instructions on a per-bridge basis, but in combination with other existing procedures provides safeguards for the traveling public. Given that there is one scour specialist and one hydraulic engineer handling a State with over twice the land area of Texas, the landlocked nature of Juneau and the occasional difficulty in getting flights in or out of Juneau and other locations, involving the DOT&PF M&O personnel is essential, and DOT&PF does this very effectively.

Findings No noncompliance findings.

Conclusions The State is Compliant on this metric.

Recommendations

Continue with the quality scour evaluations, and work toward some system to alert M&O folks of likely weather/flooding trigger events affecting scour-critical bridges they are responsible for, prior to the event.

December 31 Compliance: Compliant

Summary Complete: Yes

Metric B19 Inspection Procedures Complex Bridges

Extent of Review

No PCA is in effect. Metric was assessed based on previous review results and the reviewer's knowledge and awareness of complex bridge inspection procedures.

Observations

23 CFR 650.313 (f) requires that the State identify specialized inspection procedures and any additional inspector experience and training for the inspection of complex bridges, and that these bridges are inspected accordingly.

The State has only one complex bridge on a public road, the cable-stayed Sitka Sound Bridge in Southcoast region. Its special cable inspection is on a ten year interval, having been last done in 2015.

Findings No noncompliance findings.

Conclusions The State is in compliance on this metric.

Recommendations None.

December 31 Compliance: Compliant

Summary Complete: Yes

Metric B20 Inspection Procedures QC/QA

Extent of Review

There is no PCA in effect for this metric. The extent of the review is as follows:

- Reviewed written procedures to verify that the key components of the QC/QA procedures meet the requirements of the NBIS.
- Verified whether a process exists to document the bridges that have received QC or QA.
- Reviewed documentation of QA reviews for number of reviews, types of reviews and findings; verify that any measurable review requirements have been achieved.
- Assessed whether the procedures are effective in improving program accuracy and consistency, by determining if actions resulting from the QA findings are being taken.
- Perform interviews of personnel responsible for QC and/or QA reviews to determine or verify procedures are used.
- Also assessed based on previous review results and the reviewer's knowledge and awareness of QC/QA procedures.

Observations

23 CFR 650.313 (g) Requires that Quality Control and Quality Assurance (QC/QA) procedures are established and implemented to assure quality inspections.
For Substantial Compliance (SC): All of the following must be met for SC:
• QC/QA procedures are established, implemented, and effective, but minor aspects of the procedures are not documented or are not being performed.
• QC/QA procedures include periodic field review of inspection teams, periodic refresher training requirements, and independent review of inspection reports and computations.
Written procedures were reviewed and the key components meet the NBIS requirements. Besides the NBIS documentation of requirements, the State also spells out these requirements in the Alaska Bridges and Structures (BSM) Manual (approved by FHWA in 2017). These procedures include:

- Meeting NBIS requirements for qualifications and training (sec. 26.3.2)
- Quality Control (QC) steps in App. 26.C.1 require written justification for changing an NBI Condition Rating by more than two points (of a 0 to 9 scale), lowering an NBI condition rating to 4 (poor) or less, or raising an NBI condition rating from a 4 (poor) or less, and review of all DOT&PF-performed inspection reports and all draft consultant inspection reports for quality and consistency.
- periodic field review of inspection teams is detailed in Appendix 26.C.2 for both Alaska DOT&PF-performed inspections and consultant inspections,
- periodic refresher training requirements as detailed in sec. 26.3.2 (the period stated there has become newly outdated by the June 6, 2022 NBIS update requirements, but the Bridge Inspection Program Manager, Mr. Larry Owen,

initiated a discussion of these new requirements and when they must be implemented and is now squared away on these; an update to the BSM is pending), and

- independent review of inspection reports and computations involves general QC steps in App. 26.C.1, Quality Assurance (QA) sampling in App. 26.C.2, and load rating computation QC steps in sec. 27.1.7 of the BSM.

The process to document which bridges have received QC or QA is simple. For routine inspections, all the bridges in the inventory are assigned to exactly one of 24 inspection routes. Roughly half of these routes are inspected in odd years, and the rest in even years. Each year, Alaska DOT&PF inspection teams are identified by the Bridge Inspection Program Manager (PM), and the most senior Team Leaders (TLs) typically have the first pick of inspection routes, until all the teams are assigned to a route. There is a kickoff meeting held by the PM where any special emphasis is presented and discussed as well as reminders regarding key practices needed for quality inspections and reports (QA). On each team, for each bridge, the (non-TL) inspector is expected to draft the report and file it in the Drafts folder for that route on the inspection report space of their server, referred to as the "eVault". The TL will review it and provide comments for the inspector to address, and the PM reviews reports before they are approved as final. Because the reports are in MS Word format and kept in files for each route, the 'date modified' data for each file can indicate when it was last modified, and opening the draft will show the status of review comments and their incorporation (QC). For routine inspection QA, the PM also selects two teams to review in the field, and reviews their work in the field as it is performed on 5-10% of the bridges on the route.

The team responsible for the route is expected to have all reports for the entire route finalized by 90 days from the date the first inspection on the route began. Fracture Critical/Nonredundant Steel Tension Member (FC/NSTM) inspections are done similarly, but on a bridge-by-bridge basis (instead of by route). Underwater (UW) inspections are done by consultant, and they have tighter deadlines by contract, including a 75 day overall deadline for an approved final report.

Documentation of the QA Reviews was demonstrated to FHWA in DOT&PF office spaces, during an interview with the PM. The procedures are effective, as demonstrated by metrics B12 and B22 of this review, and by previous reviews. The metric was also assessed based on previous review results and the reviewer’s knowledge and awareness of QC/QA procedures.

Findings No noncompliance findings.

Conclusions The State is compliant on this metric.

Recommendations Continue with quality inspections.

December 31 Compliance: Compliant

Summary Complete: Yes

Metric B21 Inspection Procedures Critical Findings

Extent of Review

No PCA is in effect on this metric. Periodic notifications from the State confirmed that critical findings were being addressed. The status of the critical finding was verified during field reviews of bridges for Metrics 12 and 22. The metric was also assessed based on previous review results and the reviewer's knowledge and awareness of the State's process for addressing critical findings.

Observations

The State reported a bridge strike from an overheight load in December 2021 in Fairbanks, Alaska. The bridge was immediately closed, traffic detoured, and inspectors flown up from Juneau to assess the situation. The FHWA Alaska Division was kept apprised electronically, including photographs and telephone discussions. Plans were made to replace three girders and patch others when the weather warmed enough to proceed, and to continue detouring traffic. The reviewer came to the site after repairs were complete and verified them.

Findings

No noncompliance findings.

Conclusions

The State is compliant on this metric.

Recommendations

Continue the fine work on keeping the public safe and FHWA informed.

December 31 Compliance: Compliant
Summary Complete: Yes

Metric B22 Inventory Prepare and Maintain

Extent of Review

No PCA was in effect, so the review was based on noting any NBI data errors found during review of other metrics when resolving MARs and other data, and performing bridge field reviews sampled at a LOC of 80%, MOE of 15% or greater to verify NBI SI&A items with information in the bridge file and actual field conditions for the SI&A items identified on the Field Review Form. No safety related checks or persistent error reports were generated during the NBI submittal process.

Populations and Samples

Population Description Field review (Metric B12) bridges and NBI file
Data Source Field review (Metric B12) bridges and NBI file

Population Size: 1032
Sample Size: 18
Field Reviewed: 18
File Reviewed: 18
Interviewed:

Observations

Provisions of 23 CFR 650.315 (a) require the State to prepare and maintain an inventory of NBI bridges.
For Compliance (C): All of the following must be met for C:
• At least 95% of the sampled bridge inventory items reviewed are within the acceptable tolerances.
• FHWA data checks did not identify any bridges with data errors in the annually submitted NBI file.
In this review, 99.8% of data items were correct or within tolerance, and no data errors were found in data checks of the State's annual NBI submittal.

Findings

No non-compliance findings.

Conclusions

The State is compliant on this metric.

Recommendations

Continue the fine work.

December 31 Compliance: Compliant
Summary Complete: Yes

Metric B23 Inventory Timely Updating of Data

Extent of Review

No PCA is in effect. Verified that SI&A data was submitted to the FHWA NBI and no issues were identified. Interviewed PM to assess how the State is able to determine if bridge SI&A data is updated in the 90/180 day timeframes, and the PM demonstrated how their procedures work.
Randomly sampled bridges using Int-AL criteria to verify bridge SI&A data is updated in the 90/180 day timeframes. Assess based on previous review results and reviewer's knowledge and awareness of State's program.

Populations and Samples

Population Description Bridges identified by Sampling Tool.
Data Source NBI

Population Size: 667
Sample Size: 18
Field Reviewed:
File Reviewed: 8
Interviewed:

Observations

23 CFR 650.315 (a), (b), (c) & (d) require that NBI data be updated in a timely way.
For Compliance (C): All of the following must be met for C:
• SI&A data is submitted to the FHWA NBI by the requested date with no errors preventing FHWA acceptance of the data.
• State has a process to verify SI&A data is updated in the State inventory within 90/180 days.
• SI&A data reviewed is updated in the State inventory within 90/180 days after inspection, modification, or change in load restriction.
For routine inspections, all the bridges in the inventory are assigned to exactly one of 24 inspection routes. Roughly half of these routes are inspected in odd years, and the rest in even years. Each year, Alaska DOT&PF inspection teams are identified by the Bridge Inspection Program Manager (PM), and the most senior Team Leaders (TLs) typically have the first pick of inspection routes, until all the teams are assigned to a route. The team responsible for the route is expected to have all reports for the entire route finalized by 90 days from the date the first inspection on the route began. Fracture Critical/Nonredundant Steel Tension Member (FC/NSTM) inspections are done similarly, but on a bridge-by-bridge basis (instead of by route). Underwater (UW) inspections are done by consultant, and they have tighter deadlines by contract, including a 75 day overall deadline for an approved final report. The PM has a tracking spreadsheet to ensure critical intermediate dates are being met, and demonstrated this to the reviewer during an interview in DOT&PF Bridge Section offices.
The State has submitted NBI and Element data to FHWA by the required dates, with no errors preventing FHWA acceptance of the data. Further, they have a process to verify

the data is updated in accordance within the required interval and have shown satisfactory evidence of these updates being performed within the interval required.

Findings No noncompliance finding.

Conclusions The State is compliant on this metric.

Recommendations Continue this process and the timely updates.

December 31 Compliance: Compliant

Summary Complete: Yes

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