U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Review Year PY19

FSM Summary Sheet

State Name: Pennsylvania

Metric Number	Prior Year	Assess. Level	Dec 31 Compl.	Mar 31 Compl.
01 - Bridge Inspection Organization	C	Min	C	C
02 - Qualifications of Personnel - Program Manager	C	Int	C	C
03 - Qualifications of Personnel - Team Leader(s)	C	Min	C	C
04 - Qualifications of Personnel - Load Rating Engineer	C	Int	C	C
05 - Qualifications of Personnel - UW Bridge Inspection Di	C	Min	SC	SC
06 - Inspection Frequency - Routine - Lower Risk Bridges	C	Min	C	C
07 - Inspection Frequency - Routine - Higher Risk Bridges	C	Min	C	C
08 - Inspection Frequency - Underwater - Lower Risk Bridg	C	Min	C	C
09 - Inspection Frequency - Underwater - Higher Risk Brid	C	Min	C	C
10 - Inspection Frequency - Fracture Critical Member	SC	Int	C	C
11 - Inspection Frequency - Frequency Criteria	C	Min	C	C
12 - Inspection Procedures - Quality Inspections	C	Min	SC	SC
13 - Inspection Procedures - Load Rating	C	Min	C	C
14 - Inspection Procedures - Post or Restrict	C	Min	C	C
15 - Inspection Procedures - Bridge Files	C	Min	C	C
16 - Inspection Procedures - Fracture Critical Members	C	Min	C	C
17 - Inspection Procedures - Underwater	C	Int	C	C
18 - Inspection Procedures - Scour Critical Bridges	C	Int	SC	SC
19 - Inspection Procedures - Complex Bridges	C	Min	C	C
20 - Inspection Procedures - QC/QA	C	Min	C	C
21 - Inspection Procedures - Critical Findings	SC	Int	C	C
22 - Inventory - Prepare and Maintain	C	Int	C	C
23 - Inventory - Timely Updating of Data	SC	Min	SC	SC

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Final Summary of Metric

State: Pennsylvania
Review Year: PY19

State: Pennsylvania
Review Year: PY19
Assessment Level: Min

Metric Name: 01 - Bridge Inspection Organization
Prior Year Compliance: C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 1, the Division assessed based on previous review results, the Division bridge staff's knowledge and
awareness of the bridge inspection program in the State of Pennsylvania, and the results of the current assessment of the other
NBIP Metrics.

Observations

ORGANIZATION IN PLACE

• PennDOT is a geographically decentralized organization, with most the design, construction, and inspection level work done in the 11 geographic districts. PennDOT Central Office plays a more programmatic role. The state program manager, James Long, P.E., is based out of Central Office.

• Central Office staff includes Mike Winslow, P.E., the BMS2 manager; Scott Snyder, P.E., the bridge maintenance manager; and a currently vacant QC/QA manager. The QC/QA manager position has been vacant for all of 2018, with the Program Manager filling in for those responsibilities. A new staff member was recently hired to fill this position.

• Central Office includes other staff under the managers as detailed in the attached Org chart for the bridge inspection section.

• The District organizational structures vary somewhat, but all have a District Executive-->Assistant DE for Design --> District Bridge Engineer. Under the District Bridge Engineer all have an Assistant Bridge Engineer for Design and an Assistant Bridge Engineer for Inspection. Ultimately the District Bridge Engineer and staff are responsible for carrying out the inspection, load rating, and posting program for bridges, local or state, located within that District.

PennDOT additionally utilizes several consultant agreements under direct supervision of Program Manager for QC/QA as well as a variety of policy updates.

ORGANIZATIONAL ROLES AND RESPONSIBILITIES

• In the case of bridge inspection, most the inspection work is coordinated and performed at the District-level for state owned bridges and many locals as well. The Districts are responsible for review and acceptance of state and local inspections.

• Central Office performs an independent QA/QC program with policies and procedures detailed in the PennDOT Pub 240 Bridge Safety Inspection Quality Assurance Manual. Further information about the QA/QC program is detailed under Metric 20.

• The roles and responsibilities at each level are detailed in the PennDOT Pub 238- Bridge Safety Inspection Manual IP 1.7. The bridge owner has the overall responsibility for inspection and safety of the bridge. The Department has a clearly defined safety

responsibility under federal regulations and state statute for the safety of bridges on public roadways as well as safety of non-NBI type bridges and other structures over State Routes. The Department has legal authority to inspect any bridge to ensure NBIS
compliance. The Districts have responsibility for the locals within their geographic areas.
• Department has the authority to post any bridge for safety reasons under state law.
• PennDOT uses an electronic Bridge Management System (BMS2) to prepare and maintain the bridge inventory. Policy and procedures regarding the bridge inventory data are defined in the PennDOT Pub 100A BMS2 Coding Manual. The BMS2 system also stores and maintains bridge inspection reports, scour evaluations, load ratings, and is a core element of individual bridge files.
DELEGATED RESPONSIBILITY:

• Functions delegated to other agencies, consultants, and other bureaus within the PennDOT are clearly defined in PennDOT Pub 238 Bridge Safety Inspection Manual. Authority to take require actions is included in that delegation but the policy also specifically reserves the right for PennDOT to take immediate action if the delegated agency or bureau is unable or unwilling to insure NBIS compliance.
• Publication 238 1.7 lists responsibilities, by owner, that may be carried out by that owner.
• Local government owners are responsible for performance of and management of safety inspections under the NBIS. They may contract their own inspection or utilize in-house inspectors, or they may utilize Department consultant agreements.
• The Pennsylvania Turnpike is similarly responsible for inventory and inspection, and for reporting inspections to the Department BMS2 for submission to FHWA. Turnpike follows Department guidance and requirements, and Department provides technical assistance as necessary.
• Other state agencies have similar responsibilities to the PTC.
• Federal Lands bridges are the responsibility of FHWA/the federal agency.
• Other owners such as railroads are more complicated situations. Typically, the Pennsylvania Utility Commission has some authority over railroad bridges. The PUC may assign maintenance/inspection responsibility to a party in which case the PUC order is upheld.
• Department has the authority to work with the owner to cause inspection or to potentially inspect a railroad.

Findings

None

Conclusions

Pennsylvania is compliant with Metric 1, because the bridge inspection organization is in place and effective as indicated by the assessment of the other 22 metrics, the organizational roles and responsibilities are clearly defined and documented, delegated functions are clearly defined with the necessary authority established, and overall responsibility for the NBIS is assigned to a PM.

Compliance determinations were discussed with the State Program Manager on 12/07/201. Division leadership

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Final Summary of Metric

State Pennsylvania

Review Year PY19

were briefed on 12/18/2018.

Recommendations

None

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

-State Program Manager Jim Long, P.E. has left his position as of February 22, 2019.
-The position is being covered temporarily by Justin Bruner, P.E., although he has not had the comprehensive bridge inspection training. Mike Winslow, P.E., and other staff in the section currently covering many of the PM responsibilities, do meet the NBIS qualifications criteria.
-PennDOT has interviewed qualified candidates and reports they are likely to hire a qualified candidate for the position within the next 2 months.

-Based on the above, the March 31st compliance determination is not being changed. Metric 2 will be evaluated in PY2020 at the Intermediate Level for the new Program Manager, and a determination will be made at that time.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State: Pennsylvania
Review Year: PY19

State: Pennsylvania
Review Year: PY19
Assessment Level: Int

Metric Name: 02 - Qualifications of Personnel - Program Manager
Prior Year Compliance: C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 2, the Division performed the following review activities:
• Assessed based on previous review results and the Division bridge staff's knowledge and awareness of the Program Manager's (PM) qualifications,
• Reviewed the current qualifications of the State PM,
• Verified the PM's qualifications through interview with the PM.
•

Observations

The State's Program Manager is James Long, PE, who has held the position since June 2010.
QUALIFICATIONS:
• The Division confirmed James Long's active Pennsylvania PE license status using the Pennsylvania Department of State public online professional license verification tool, as of 12/06/2018. A screenshot of the confirmation that his license is active is included in the metric documentation.
• James Long, PE has successfully completed the PennDOT FHWA-approved bridge inspection training as documented using the PennDOT training catalog. The PennDOT training catalog documents dates of attendance and pass/fail status for all attendees of the PennDOT bridge inspection comprehensive and refresher trainings. A screenshot of this documentation is included in the metric documentation.

REFRESHER TRAINING:
As shown in the PennDOT training catalog, James Long, PE, is current for his refresher training. The requirement is to pass the refresher training bi-annually. This is reflected in the screenshot of the PennDOT training catalog attached.
INTERVIEW:
In accordance with Metric requirements, a brief interview was conducted with Mr. Long. The interview questions were provided by BSE North, and responses are attached in the documents library under PY2019 Metric 2. He did not indicate any pressing training needs as indicated on question 4 of the interview, and has kept up with training in his time as PM.

Findings

None

Conclusions

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Final Summary of Metric

State: Pennsylvania

Review Year: PY19

Pennsylvania is compliant with Metric 2, because the State's PM has the required qualifications, and the State's PM has completed periodic bridge inspection refresher training according to State policy.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

None

Dec 31 Compliance: C

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

-State Program Manager Jim Long, P.E. has left his position as of February 22, 2019.
-This position within the PennDOT organization is being covered temporarily by Justin Bruner, P.E., although he has not had the comprehensive bridge inspection training. Mike Winslow, P.E., and other staff in the section are currently covering many of the PM responsibilities, do meet the NBIS qualifications criteria.
-PennDOT has interviewed qualified candidates and reports they are likely to hire a qualified candidate for the position within the next 2 months.

-Based on the above, the March 31st compliance determination is not being changed. Metric 2 will be evaluated in PY2020 at the Intermediate Level for the new Program Manager, and a determination will be made at that time.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

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Final Summary of Metric

State: Pennsylvania | Review Year: PY19

State: Pennsylvania | Review Year: PY19 | Assessment Level: Min

Metric Name: 03 - Qualifications of Personnel - Team Leader(s) | Prior Year Compliance: C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 3, the Division assessed based on prior review results and on the Division bridge staff's knowledge and awareness of the State's process for monitoring Team Leader qualifications.

Observations

REQUIRED QUALIFICATIONS:

• All inspectors in Pennsylvania are required to complete the FHWA-approved PennDOT bridge inspector training and the PennDOT refresher trainings. Under State policy, the NHI 130055 training and NHI refresher trainings are not suitable substitutes. Individuals who have successfully completed NHI 130055 and present evidence in the form of an official NHI certificate or transcript are able to sit for an abbreviated, 1-week version of the PennDOT bridge inspector training focusing on review and PennDOT specific policy and data item coding.
• The FHWA approval of the PennDOT bridge inspector training as both comprehensive and equivalent to NHI-130055 was provided on December 28, 2006. In further discussions with PennDOT's consultant that delivers the training as well as the FHWA HQ, the Division has established that aside from some item number references, the first 2-weeks of the PennDOT training is virtually identical to NHI-130055 aside from some minor changes to sections 6.3d and 7.1. The third week of the training focuses on PennDOT-specific items and requirements. Successful completion of the course provides a state certification of Certified Bridge Safety Inspector (CBSI).
• For Inspectors who have successfully completed NHI-130055, PennDOT offers a 1-week"Policies and Practices" course that can qualify the individual as a CBSI without needing to sit for the full 3-week course.
• PennDOT maintains a catalog of all inspection training attendees, the dates of attendance, the pass or fail result of their exam, and the dates of all refresher trainings they have ever attended.
• Experience requirements for team leaders are the same as what is specified by NBIS regulation. Experience requirements are not tracked in the PennDOT training catalog and would be either tracked by PennDOT HR when hiring an individual into a Team Leader job classification (ie the NBIS requirements are requirements to be considered for the team leader job) or would be submitted by the consultant as a part of their RFQ package.

REQUIRED REFRESHER TRAINING:

PennDOT develops refresher trainings every 2 years, and delivers that training throughout the next biennial cycle. All inspectors are required to successfully complete the PennDOT refresher training every 2 years. The completion of the refresher training is tracked in the same PennDOT training catalog as for the comprehensive training.

PREVIOUS REVIEW RESULTS:

• The Division determined that PennDOT was fully compliant with Metric 3 after an In-Depth review in PY16, and

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the metric is next scheduled to be assessed at the Intermediate-AL in PY2021.
• Whether the team leader fulfilled the training and refresher training requirements was easily determined utilizing the training catalog. Whether the team leader had the necessary experience was determined either through verification of the status of their PE license, or through interview of the individual when relying on years of inspection experience.
• The Division did develop some minor recommendations to help PennDOT strengthen the experience requirements of consultant TLs on consultant agreements. PennDOT and the FHWA continue to work on updating consultant agreement policy in the 2016 update of the PennDOT Publication 238- Bridge Safety Inspection Manual.
• For the 19 field review bridges, the FHWA confirmed the qualifications of the TL listed on the inspection report, as documented under Metric 12. All TLs reviewed were qualified, as indicated by the inspection report and PennDOT training catalog, contributing to the knowledge and awareness. Under Metric 12, inspector experience requirements were checked either through PE license verification or estimated based on the date of their completion of the inspection training.

Findings

None

Conclusions

Pennsylvania is compliant with Metric 3, because all TLs have the required qualifications, and all TLSs complete bridge inspection refresher training every other year according to state policy.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

None

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Int
Metric Name	04 - Qualifications of Personnel - Load Rating Engineer			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 4, the Division performed the following review activities:
• Assessed based on previous review results and the Division's knowledge and awareness of the Load Rating Engineer (LRE) qualifications and responsibilities,
• Performed interview of the LRE,
• Reviewed documentation of LRE's qualifications.
•

Observations

OVERALL RESPONSIBILITY FOR LOAD RATING:

• From an overall program and policy perspective, James Long, P.E., the state's Program Manager, is the LRE for the State of Pennsylvania. Central Office maintains overall responsibility for load rating, including performance but more importantly policy. Central Office also maintains several active data quality initiatives related to load rating data, stemming from FHWA program reviews and metric 13 reviews.
• PennDOT is geographically decentralized, and most load rating performance and quality management functions reside with the District staff. Each District has at least 1 District LRE, who is responsible for state and local owner load ratings in their respective District.
• The Division last assessed Metric 4 at the Intermediate-level in PY16. As a component of that review, the Division did look at each of the PennDOT District LREs' qualifications.

QUALIFICATION VERIFICATION:

• As also documented under Metric 2, the Division verified James Long's current PA PE licensure status as of December 2018. See attached screenshot from the Pennsylvania's Professional Licensure Verification System.
• An interview outlining the qualifications of James Long PE is also attached in Metric 2
• Supplemental question added to this interview for Metric 4: Describe the responsibilities of the Load Rating Engineer position.
  • Load rating engineer is responsible for Publication 238 policy and procedures related to load ratings. Much of the activities of the position cross over with the PM responsibilities for PennDOT. Load rating QA items related to 2009 FHWA load rating and posting process review continue out of central office.
  • Much of the day-to-day responsibility for load rating is delegated to Districts; overall central office is more responsible for data quality and policy.

Indicated as well that the district load rating engineer is required to be a PE. These qualifications were reviewed the last time Metric 4 was evaluated at the Intermediate-AL (PY16).

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Final Summary of Metric

State: Pennsylvania

Review Year: PY19

Findings

None

Conclusions

Pennsylvania is compliant with Metric 4, because the State Load Rating Engineer is a registered professional engineer, and the State Load Rating Engineer has overall and programmatic responsibility for the load rating of all bridges.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018

Recommendations

None

Dec 31 Compliance: C

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

-State PM and LRE Jim Long, P.E. has left his position as of February 22, 2019.
-This position within the PennDOT organization is being covered temporarily by Justin Bruner, P.E. His P.E. licensure status was verified 3/27/2019 utilizing the state's online license verification tool.
-PennDOT has interviewed qualified candidates and reports they are likely to hire a qualified candidate for the position within the next 2 months.

-Based on the above, the March 31st compliance determination is not being changed. Metric 2 and 4 will be evaluated in PY2020 at the Intermediate Level for the new Program Manager.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

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Final Summary of Metric

State: Pennsylvania
Review Year: PY19

State: Pennsylvania
Review Year: PY19
Assessment Level: Min

Metric Name: 05 - Qualifications of Personnel - UW Bridge Inspection
Prior Year Compliance: C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 5, the Division assessed based on prior review results and on the Division bridge staff's knowledge and awareness of the State process for monitoring underwater bridge inspection diver qualifications.

Observations

• The Division last assessed Metric 5 at the Intermediate-level in PY2016. During that review, Division reviewed the qualifications for all dive inspectors currently on contract in the state, including the PennDOT personnel and consultants, and found no issues.
• Per state policy, the dive inspectors may be certified by any of the available NHI or PennDOT training courses. Unlike with team leaders, the NHI course is an acceptable alternative to the PennDOT training course.
• There have been no changes to the PennDOT process for monitoring underwater bridge inspection divers since the previous review. As a part of the general scope of work for underwater inspection consultant agreements, the consultant must submit resumes for each team member to PennDOT for approval, and the consultant must submit resumes for approval if they add team members later in the contract.
• File Reviews for Metric 17 (Underwater Inspection Procedures) at the Intermediate Assessment Level added to reviewer knowledge and awareness, forming the basis for all findings in Metric 5

Findings

The reviewer found no record of the participating divers present in the bridge file, or inspection reports for all files reviewed under Metric 17. Although every signed/sealed UW inspection report included a statement certifying the qualifications of all inspection divers by the Engineer of Record, no list of the participating divers were present.

The population of dive inspectors is known overall based on the two statewide consultant agreements and only one Departmental dive team. The qualifications of these inspectors were last verified in PY2016, with no findings at that time.

Conclusions

Pennsylvania is substantially compliant with Metric 5, because all divers listed in the inspection report are qualified, but it is unclear whether all inspection divers were listed due to inadequate documentation of all divers participating in inspections.

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Final Summary of Metric

State Pennsylvania

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Compliance determinations were discussed with State Program manager on 12/7/2018. Division leadership were briefed on 12/18/2018.
Improvement Plan is under development and will be attached to 3/31 Final Resolution.

Recommendations

Regular NBIP inspection reports commonly list all Team Members participating in an inspection, and clearly identify the Team leader. All future Underwater Inspection Reports should follow common NBIP reporting practice, by listing the name and credentials of all participating divers, and identifying the Team Leader.

Dec 31 Compliance SC

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

No change in compliance determination from 12/31.

Improvement plan has been developed with PennDOT and reviewed by BSE. IP is attached in documents library and an entry created on dashboard.

Mar 31 Compliance SC

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	06 - Inspection Frequency - Routine - Lower Risk Bridg	Prior Year Compliance	C		

Metric Summary - Complete by December 31st

Extent of Review

For the Minimum-level assessment of Metric 6, the Division performed the following review activities:

- Generated MAR6 within 30 days of NBI data acceptance and reviewed to resolve all inspections flagged as overdue.
- Reviewed MAR6 Summary for indication of any new deficiencies or new trends.
- Assessed based on MAR6 Snapshot, previous review results, and on the Division's knowledge and awareness of Pennsylvania routine inspection policy, procedures, and program.
-

Observations

MAR6 GENERATION:

HIBS National Bridge Inventory Engineer accepted the PennDOT data submittal on 5/31/2018. The DIvision generated MAR6 on 6/12/2018. The Division completed review by 6/21/2018.

MAR6 MINIMUM-AL REVIEW:

MAR6 Minimum-AL initially flagged 3 bridges as potentially overdue for inspection.

For 2 of the bridge records, review indicated that the date of the last routine inspection submitted in the 2017 submittal was incorrect, and had been corrected for the 2018 submittal. Because the date moved 1-month earlier, the MAR logic considered these bridges to have a negative interval, which caused them to be flagged. Review of bridge files determined bridges were not overdue.

For the other bridge record, the bridge is privately owned. Due to increased scrutiny of privately owned bridges over state routes, PennDOT is going to begin performing full routine inspections on the bridge at a 24-month interval. PennDOT had been conducting Highway Environment type inspections on the bridge at a 24 month frequency, which is why a previous (04/06) inspection had been coded in the NBI. Highway Environment inspections are conducted by PennDOT on structures that overpass state right-of-way, without accessing the private right-of-way. The typical scope in these cases is to inspect to whatever extent practical from the underside, without access to perform inspection of top side of deck. The purpose is to protect travelling public from potential falling debris, etc from the overpass. Highway Environment inspections were completed in 2016, 2014, 2012, 2010, 2008 and 2006. Routine inspection date 4/26/2018 and is therefore current and not overdue for inspection.

MAR6 SNAPSHOT:

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Final Summary of Metric

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After override of the 3 bridges, MAR6 snapshot indicates Compliance.

PREVIOUS REVIEW RESULTS AND TRENDS:

The Division assessed PennDOT as Substantially Compliant with Metric 6 for the review years prior PY2017. The Division last reviewed Metric 6 as the Intermediate-AL in PY2018. Based on full MAR resolution during that review, the Division assessed PennDOT as Compliant.

To identify any potential trends to the previous Intermediate-AL review, the PY2019 MAR Assessment Level was toggled to Intermediate-AL and then compared to the PY2018 MAR.

PY2018 MAR6 initially flagged 41 bridge records as possibly being overdue for inspection. All 41 were resolved, with the most prevalent issue being that the inspections had been performed at the correct interval but not accepted at the time of the 2017 NBI Submittal. PY2019 MAR6 initially flagged 3 bridge records as possibly being overdue, with resolution of these described above.

PY2018 MAR6 initially flagged 15 bridge records as having been inspected at an interval exceeding 28 months. The Division reviewed and resolved all 15, with the most prevalent issue being that the bridge had a mid-interval inspection. This occurs with some regularity because this is how PennDOT policy allows inspection dates to move. The bridge is inspected at the 24 month interval, then inspected again at some point between 24 month inspections. PY2019 MAR6 initially flagged 41 bridges as having been inspected at an interval exceeding 28 months.

Because of the increase between PY2018 and PY2019, these 41 bridge records were spot checked and resolved. 4 bridge records indicated a mid-interval inspection was performed due to extensive rehab (deck/super replacement type work) that would necessitate inspection prior to opening. 2 bridge records appeared to have dates submitted wrong on the 2017 inspection that were also resolved on PY2018 MAR. The remaining 35 bridge records indicated a mid-interval routine inspection was performed, likely to move target inspection date between seasons or years for efficiency/ grouping for inspectors.

An example of how one District documents in inspection notes the use of mid-interval to move inspection date is provided below from BRKEY 33467:

01.) Move Bridge Routine inspection to Summer Months. MJS 5-15-17.
02.) STRUCTURE IS NOW MOVED TO SEPTEMBER (ODD YEAR INSPECTION) DUE TO WATER DEPTH SURROUNDING PIER. 9-22-17

Example from another District from BRKEY 47519:

11/4/2016- Regular inspection performed. Structure is on 2 yr inspection cycle, but next inspection will be 11/2017 to keep structure in cycle w/ surrounding structures-TS

PY2018 MAR6 initially flagged 6 bridges with an apparent inspection interval between 25 and 28 months and 5 bridges with an apparent interval of 25 months. All were resolved or had documented justification for 1-month delay. PY2019 MAR6 indicated 13 bridges with an apparent inspection interval between 25 and 28 months and 7 bridges with apparent interval of 25 months. Although this is an increase, spot checks performed on the 41

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Final Summary of Metric

State Pennsylvania

Review Year PY19

bridges that initially flagged as appearing to have an inspection interval exceeding 28 months lead to knowledge and awareness of no significant trend here that would warrant further review.

PENNDOT POLICY AND TRACKING REPORTS:

-PennDOT submitted 48-month extended interval inspection criteria per TA 5410.21 to FHWA on 11/27/2018. Criteria are under review by Senior Bridge and Tunnel Inspection Engineer as of 12/11/2018. After approval, Publication 238 (Bridge Inspection Manual) and Publication 100A (BMS2 Manual) will be updated to reflect the optional 48-month interval.

-PennDOT documents reasons for delay in the inspection notes section of the bridge inspection. PennDOT Central Office will also document any delays in inspection in their monthly "M1" report process. The M1 report is a monthly report run on production data that flags any overdue inspections and provides districts with a list of all upcoming inspections. The M1 report also serves other purposes, such as verifying that the correct inspection frequency is coded.

Findings

None.

Conclusions

Pennsylvania is compliant with Metric 6, because all bridges were inspected within the required NTE 24-month interval.

Compliance determinations were discussed with the State Program Manager on 12/7/2018. Division leadership were briefed on 12/17/2018.

Recommendations

None.

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes effecting compliance status since the preliminary determination.

As of 1/22/2019 the Division, with HQ Senior Bridge and Tunnel Engineer's concurrence, approved the PennDOT 48-month routine inspection interval criteria. Approval letter and summary of PennDOT criteria has been

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Final Summary of Metric

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attached in the attachment library. Note the change to PennDOT policy (publication 238) is being developed; therefore, PennDOT is not utilizing 48-month interval yet.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	07 - Inspection Frequency - Routine - Higher Risk Bridg	Prior Year Compliance	C		

Metric Summary - Complete by December 31st

Extent of Review

For the Minimum-level assessment of Metric 7, the Division performed the following review activities:

- Generated MAR7 within 30 days of NBI data acceptance and reviewed to resolve all inspections flagged as overdue.
- Reviewed MAR7 Summary for indication of any new deficiencies or new trends.
- Assessed based on MAR7 Snapshot, previous review results, and on the Division's knowledge and awareness of Pennsylvania routine inspection policy, procedures, and program.
-

Observations

MAR7 GENERATION:

HIBS National Bridge Inventory Engineer accepted the PennDOT data submittal on 5/31/2018. The Division generated MAR7 on 6/12/2018. The Division completed review by 6/21/2018.

MAR6 MINIMUM-AL REVIEW:

MAR7 Minimum-AL did not flag any bridges.

MAR7 SNAPSHOT:

MAR7 snapshot indicates Compliance.

PREVIOUS REVIEW RESULTS AND TRENDS:

The Division last reviewed Metric 7 as the Intermediate-AL in PY2018. Based on full MAR resolution during that review, the Division assessed PennDOT as Compliant.

To identify any potential trends to the previous Intermediate-AL review, the PY2019 MAR Assessment Level was toggled to Intermediate-AL and then compared to the PY2018 MAR.

PY2018 MAR7 initially flagged 43 bridge records as possibly being overdue for inspection. All 43 were resolved, with the most prevalent issue being that the inspections had been performed at the correct interval but not accepted at the time of the 2017 NBI Submittal. PY2019 MAR7 initially flagged 0 bridge records as possibly being overdue for inspection.

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PY2018 MAR7 initially flagged 7 bridge records as having been inspected at an apparent interval exceeding 28 months. The Division reviewed and resolved all 7, with the most prevalent issue being that the bridge had a mid-interval inspection. This occurs with some regularity because this is how PennDOT policy allows inspection dates to move. The bridge is inspected at the 24 month interval, then inspected again at some point between 24 month inspections. PY2019 MAR7 initially flagged 17 bridges as having been inspected at an interval exceeding 28 months.

Because of the increase between PY2018 and PY2019, these 17 were reviewed and resolved. Based on bridge file review, all were inspected at an interval of 24 months or less. 8 had routine inspections completed at a 24 month interval, followed by a mid-interval First Time inspection after significant rehabilitation work. 7 had routine inspections completed at a 24 month interval, followed by a mid-interval inspection, likely meant to move inspection date between seasons/years for inspector efficiency. 2 had received routine inspection at a 24-month frequency, followed by a mid-interval inspection that may have been more appropriately coded as other/special or damage.
An example of how one District documents in inspection notes the use of mid-interval to move inspection date is provided below from BRKEY 33467:

01.) Move Bridge Routine inspection to Summer Months. MJS 5-15-17.
02.) STRUCTURE IS NOW MOVED TO SEPTEMBER (ODD YEAR INSPECTION) DUE TO WATER DEPTH SURROUNDING PIER. 9-22-17

Example from another District from BRKEY 47519:

11/4/2016- Regular inspection performed. Structure is on 2 yr inspection cycle, but next inspection will be 11/2017 to keep structure in cycle w/ surrounding structures-TS

PY2018 MAR7 initially flagged 10 bridges with an apparent inspection interval between 25 and 28 months and 2 bridges with an apparent interval of 25 months. All were resolved or had documented justification for 1-month delay. PY2019 MAR6 indicated 9 bridges with an apparent inspection interval between 25 and 28 months and 6 bridges with apparent interval of 25 months. Although this is an increase, spot checks performed on the 17 bridges that initially flagged as appearing to have an inspection interval exceeding 28 months lead to knowledge and awareness of no significant trend here that would warrant further review.

PENNDOT POLICY AND TRACKING REPORTS:

-PennDOT documents reasons for delay in the inspection notes section of the bridge inspection. PennDOT Central Office will also document any delays in inspection in their monthly "M1" report process. The M1 report is a monthly report run on production data that flags any overdue inspections and provides districts with a list of all upcoming inspections. The M1 report also serves other purposes, such as verifying that the correct inspection frequency is coded.

Findings

None.

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Final Summary of Metric

State: Pennsylvania

Review Year: PY19

Conclusions

Pennsylvania is compliant with Metric 7, because all bridges were inspected within the required NTE 24-month interval.

Compliance determinations were discussed with the State Program Manager on 12/7/2018. Division leadership were briefed on 12/17/2018.

Recommendations

Dec 31 Compliance: C

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	08 - Inspection Frequency - Underwater - Lower Risk B	Prior Year Compliance	C		

Metric Summary - Complete by December 31st

Extent of Review

For the Minimum-level assessment of Metric 8, the Division performed the following review activities:

- Generated MAR8 within 30 days of NBI data acceptance and reviewed to resolve all inspections flagged as overdue.
- Reviewed MAR8 Summary for indication of any new deficiencies or new trends.
- Assessed based on MAR8 Snapshot, previous review results, and on the Division's knowledge and awareness of Pennsylvania underwater (UW) inspection policy, procedures, and program.
-

Observations

MAR8 GENERATION:

HIBS National Bridge Inventory Engineer accepted the PennDOT data submittal on 5/31/2018. The Division generated MAR8 on 6/12/2018. The Division completed review by 6/22/2018.

MAR8 MINIMUM-AL REVIEW:

MAR8 Minimum-AL initially flagged 23 bridges as potentially overdue for inspection. The Division reviewed the bridge file for these 23 bridges and determined all were current with UW inspection intervals of 60 months or less.

Of these, 5 bridges had data errors with the dates submitted on the 2018 submittal, but were not overdue for inspection based on 60-month UW frequency. 3 bridges were new within last 60 months and only just coming due for first UW inspection in 10 and 11/2018 (later review verified that they received them). 2 had received UW inspection in 2016 but subsequently had "inspection required" 7a06 tab unchecked (possibly due to feedback about water level from divers/routine inspections). The remaining 13 had required an UW inspection on a previous cycle due to water levels, but inspectors were able to inspect the substructure units under lower water conditions on the most recent routine. In these cases the UW "inspection required" tab would be unchecked at the time of routine and the UW need would be re-evaluated after future routine inspections.

MAR8 SNAPSHOT:

After resolution and override of the 23 bridges, MAR8 snapshot indicates Compliance.

PREVIOUS REVIEW RESULTS AND TRENDS:

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The Division last reviewed Metric 8 as the Intermediate-AL in PY2018. Based on full MAR resolution during that review, the Division assessed PennDOT as Compliant.

To identify any potential trends to the previous Intermediate-AL review, the PY2019 MAR Assessment Level was toggled to Intermediate-AL and then compared to the PY2018 MAR.

PY2018 MAR8 initially flagged 33 bridge records as possibly being overdue for inspection. All 33 were resolved, and similar to this year the most prevalent issue was that the bridge had required an UW inspection on a previous cycle due to water levels, but inspectors were able to inspect the substructure units under lower water conditions on the most recent routine. For comparison, the PY2019 MAR8 flagged 23 bridges as possibly being overdue for inspection.

PY2018 MAR8 initially flagged 33 bridges as having an apparent inspection interval exceeding 64 months. After review of the bridge file, the Division resolved all 33 bridges, with the most prevalent issue (13 occurences) being a group of bridges that received UW inspection under PCA in PY2016 but were now current and would not require inspection again for 2 or more years. The second most prevalent issue (10 instances) were data errors with the submitted date. For comparison, PY2019 MAR8 flagged 7 bridges with an apparent inspection interval exceeding 64 months. Because of the downward trend, no spot checks are considered warranted here for this Minimum-AL review.

PY2018 MAR8 initially flagged 2 bridges with an apparent inspection interval of 62 to 64 months, both of which were inspected under PCA in PY2016 and were current and not requiring inspection for 2 or more years. PY2018 MAR8 identified 1 bridge with an apparent inspection interval of 61 months, which was determined to be due to a coding error with the submitted date. PY2019 MAR8 did not flag any bridges with 62 to 64 month or 61 month apparent inspection intervals.

PENNDOT POLICY AND TRACKING:

PennDOT does not currently utilize the up to 72 months extended underwater inspection interval criteria. While they have submitted 48-month extended interval criteria, they are not currently pursuing extended interval UW inspections criteria.

PennDOT documents reasons for delay in the inspection notes section of the bridge inspection. PennDOT Central Office will also document any delays in inspection in their monthly "M1" report process. The M1 report is a monthly report run on production data that flags any overdue inspections and provides districts with a list of all upcoming inspections. The M1 report also serves other purposes, such as verifying that the correct inspection frequency is coded.

The UW version of the M1 additional does many validations to catch bridges which were not previously identified for UW inspection but may need it. Some of these checks include verification of water depth (Item IN18) when it is inventoried as >4ft for any given substructure unit; verification of the 60 mo or reduced interval based on sub and scour coding; and check of IN16 UW Inspection type. IN 16 is coded E for no UW required" if water levels allowed, but codes C or D would indicate UW elements could not be inspected on the routine inspection; codes A

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and B indicate an UW dive inspection or probing/inspection done with divers but not requiring an actual dive.

Findings

None.

Conclusions

Pennsylvania is compliant with Metric 8, because all UW inspections were done within the required NTE 60-month interval.

Compliance determinations were discussed with the State Program Manager on 12/7/2018. Division leadership were briefed on 12/17/2018.

Recommendations

None.

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	09 - Inspection Frequency - Underwater - Higher Risk B	Prior Year Compliance	C		

Metric Summary - Complete by December 31st

Extent of Review

For the Minimum-level assessment of Metric 9, the Division performed the following review activities:

- Generated MAR9 within 30 days of NBI data acceptance and reviewed to resolve all inspections flagged as overdue.
- Reviewed MAR9 Summary for indication of any new deficiencies or new trends.
- Assessed based on MAR9 Snapshot, previous review results, and on the Division's knowledge and awareness of Pennsylvania underwater (UW) inspection policy, procedures, and program.
-

Observations

MAR8 GENERATION:

HIBS National Bridge Inventory Engineer accepted the PennDOT data submittal on 5/31/2018. The Division generated MAR8 on 6/12/2018. The Division completed review by 6/22/2018.

MAR8 MINIMUM-AL REVIEW:

MAR8 Minimum-AL initially flagged 17 bridge records as potentially overdue for inspection. The Division reviewed the bridge file for these 17 bridges and determined all were current with UW inspection intervals of 60 months or less.

Of these, 2 bridges were current and not due for inspection at the time of review, but had a data error on the 2018 submittal (7a07 "inspection required" tab was not checked, so Item 92 and 93 did not submit a frequency or date). The remaining 14 had required an UW inspection on a previous cycle due to water levels, but inspectors were able to inspect the substructure units under lower water conditions on the most recent routine. In these cases the UW "inspection required" tab would be unchecked at the time of routine and the UW need would be re-evaluated after future routine inspections.

MAR9 SNAPSHOT:

After resolution and override of the 17 bridges, MAR9 snapshot indicates Compliance.

PREVIOUS REVIEW RESULTS AND TRENDS:

The Division last reviewed Metric 9 as the Intermediate-AL in PY2018. Based on full MAR resolution during that review, the Division assessed PennDOT as Compliant.

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To identify any potential trends to the previous Intermediate-AL review, the PY2019 MAR Assessment Level was toggled to Intermediate-AL and then compared to the PY2018 MAR.

PY2018 MAR9 initially flagged 19 bridge records as possibly being overdue for inspection. All 19 were resolved, and similar to this year the most prevalent issue was that the bridge had required an UW inspection on a previous cycle due to water levels, but inspectors were able to inspect the substructure units under lower water conditions on the most recent routine. For comparison, the PY2019 MAR8 flagged 17 bridges as possibly being overdue for inspection.

PY2018 MAR9 initially flagged 9 bridges as having an apparent inspection interval exceeding 64 months. After review of the bridge file, the Division resolved all 9 bridges as having been inspected with a frequency of 60 months or less, with the most prevalent issue being bridges that were newly identified for UW inspection on the most recent routine, and received inspection in a timely manner from the time the need was identified. For comparison, PY2019 MAR9 shows 1 bridge having been inspected at an apparent interval exceeding 64 months.

PY2018 MAR9 initially flagged 0 bridges with an apparent inspection intervals of 62 to 64 months or 61 months. PY2019 MAR9 similarly did not flag any bridges with 62 to 64 month or 61 month apparent inspection intervals.

PENNDOT POLICY AND TRACKING:

PennDOT documents reasons for delay in the inspection notes section of the bridge inspection. PennDOT Central Office will also document any delays in inspection in their monthly "M1" report process. The M1 report is a monthly report run on production data that flags any overdue inspections and provides districts with a list of all upcoming inspections. The M1 report also serves other purposes, such as verifying that the correct inspection frequency is coded.

The UW version of the M1 additional does many validations to catch bridges which were not previously identified for UW inspection but may need it. Some of these checks include verification of water depth (Item IN18) when it is inventoried as >4ft for any given substructure unit; verification of the 60 mo or reduced interval based on sub and scour coding; and check of IN16 UW Inspection type. IN 16 is coded E for no UW required" if water levels allowed, but codes C or D would indicate UW elements could not be inspected on the routine inspection; codes A and B indicate an UW dive inspection or probing/inspection done with divers but not requiring an actual dive.

Findings

None.

Conclusions

Pennsylvania is compliant with Metric 9, because all UW inspections were done within the required NTE 60-month interval.

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Final Summary of Metric

State: Pennsylvania

Review Year: PY19

Compliance determinations were discussed with the State Program Manager on 12/7/2018. Division leadership were briefed on 12/17/2018.

Recommendations

None.

Dec 31 Compliance: C

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Int
Metric Name	10 - Inspection Frequency - Fracture Critical Member			Prior Year Compliance	SC

Metric Summary - Complete by December 31st

Extent of Review

For the Intermediate Assessment Level Review of Metric 10, the Division performed the following review activities:

- Monitored the PY2018 Improvement Plan.
- Generated MAR10 within 30 days of NBI data acceptance and reviewed to resolve all bridges indicated as overdue for inspection.
- Reviewed MAR10 Summary for indication of any new deficiencies and compared trends to previous year MAR10.
- Assessed based on MAR10 Snapshot, previous review results, and on the reviewer's knowledge and awareness of fracture critical member (FCM) inspection interval policies, procedures, and program.
- Reviewed MAR10 for all bridges with inspection intervals shown at 25 months, 26-28 months, or exceeding 28 months.
- Reviewed procedures to ensure there is a process to document unusual circumstances and that the process is being followed.
-

Observations

MAR10 GENERATION:

HIBS National Bridge Inventory Engineer accepted the PennDOT data submittal on 5/31/2018. The Division generated MAR10 on 6/12/2018. The Division completed the time-critical review of all apparent overdue inspections by 6/22/2018, and completed the review of inspections that were not overdue but had an apparent interval exceeding 24 months by 11/19/2018. Review complete date in MAR10 reflects the date the overall Intermediate-AL review was completed.

MAR10 OVERDUE INSPECTION REVIEW:

MAR10 Intermediate-AL initially flagged 14 bridge records as potentially overdue for inspection. The Division reviewed the bridge file for these 12 bridges and determined the following:

4 of these bridges are permanently closed to traffic and no longer require routine FCM inspection; likely continue to be carried on the inventory in anticipation of future rehabilitation/replacement work. 5 bridges were rehabbed or replaced such that they no longer have FCMs. 2 bridges had errors in the inspection date submitted on the 2017 submittal, but are current and not overdue for inspection. 1 bridge had an error in the date submitted on the 2017 submittal, which was corrected for the 2018 submittal. Because the inspection date moved earlier, the MAR logic considered these bridges to have a negative interval, which caused it to be flagged. Review of bridge

file determined bridge was not overdue.

MAR10 INTERMEDIATE-AL REVIEW:
MAR10 Intermediate-AL initially flagged 7 bridge records with apparent FCM inspection intervals exceeding 28 months. After review of these bridge files, the Division determined all had received a mid-interval FCM inspection, and did not have an FCM inspection interval exceeding 24 months. This is the allowable method per PennDOT policy to move inspections between seasons/years for inspection planning and efficiency purposes. This may also occur if the FCM inspection interval is lowered to 12 months and an inspection had not been accepted at the time of the 2017 submittal.
MAR10 initially flagged 4 bridge records with an apparent FCM inspection interval of 26-28 months. After review of these bridge files, the Division determined all had received FCM inspected at an interval of 24 months or less. 2 had received a mid-interval FCM inspection, and 2 had issues with the dates submitted on the 2018 or 2017 submittals.
MAR10 initially flagged 3 bridges as having an apparent FCM inspection interval of 25 months. The Division determined this data was correct. For 1 bridge, the inspection with RR flagging had been performed 2 days early (pushing it into October in 2014) on a previous cycle due to availability. The following inspection with RR flagging occurred in November 2016. The Division verified that the 2018 inspection was completed on time (11/2018). For 1 bridge, there was a delay for equipment access. For 1 bridge, there was a delay for AMTRAK outage/flagging.
MAR10 SNAPSHOT:

After resolution and override of the 26 bridges as described above, MAR10 snapshot indicates Compliance.

PREVIOUS REVIEW RESULTS AND TRENDS:

The Division had previously assessed PennDOT as Conditionally Compliant with Metric 10 as recently as PY2015, with PennDOT achieving Substantial Compliance in PY2016. The Division last reviewed Metric 10 as the Intermediate-AL in PY2018. Based on full MAR resolution during that review, the Division assessed PennDOT as Substantially Compliant, due to 2 bridges (0.29%) having been inspected at an interval of 26-28 months. Although the Division fully reviewed and resolved all MAR10 flags for PY2019, the following comparison is presented for future reviews to provide knowledge and awareness and a baseline for any trends.
PY2018 MAR10 initially flagged 21 bridge records with apparent overdue inspections. These were all resolved and had all received inspection at an interval of 24 months or less. The most prevalent issues were FCM inspections not being accepted at the time of the 2017 submittal (12 occurrences) and bridges that had been rehabbed and replaced such that they no longer had FCMs (6 occurrences). For comparison, PY2019 MAR10 flagged 14 apparent overdue inspections.
PY2018 MAR10 initially flagged 3 inspections with apparent intervals exceeding 28 months. Of these, 1 was determined to have been inspected 2 months late. For comparison, PY2019 MAR10 initially flagged 7 bridges with apparent interval exceeding 28 months, but all were determined to have received inspection at an interval of 24 months or less.
PY2018 MAR10 initially flagged 1 bridge with an interval of 26-28 months; this bridge was determined to have received FCM inspection 3 months late due to equipment and flagger availability. The Division determined that while this may be adequate justification for a 1-month delay, it is not justifiable for a 3-month delay. For

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comparison, PY2019 MAR10 flagged 4 bridges with an apparent interval of 26-28 months, all of which had received inspection at an interval of 24 months or less.
PY2018 MAR10 initially flagged 0 bridges with an apparent interval of 25 months; PY2019 flagged 3 that were determined to have been justifiable delays.
Comparison to the PY2015 MAR10 shows the significant improvements PennDOT has made under Metric 10 in the last 5-years. PY2015 MAR10 initially flagged 229 overdue inspections, including several that were actually found to be overdue and required immediate FCM inspection under PCA. Additionally, PY2015 MAR10 review determined 59 bridges had been inspected at an interval exceeding 28 months.
PENNDOT POLICY AND TRACKING:
PennDOT documents reasons for delay in the inspection notes section of the bridge inspection. PennDOT Central Office will also document any delays in inspection in their monthly "M1" report process. The M1 report is a monthly report run on production data that flags any overdue inspections and provides districts with a list of all upcoming inspections. The M1 report also serves other purposes, such as verifying that the correct inspection frequency is coded.
IMPROVEMENT PLAN:
The PY2017 and PY2018 improvement plans carried forward the main practice of continuing to run the M1 reporting for FCM inspections. There were a small number of remaining issues (2 bridges inspected at an interval of 26-28 months) remaining after the PY2018 review. It was felt the PY2017 IP had successfully addressed these issues and one more cycle would likely bring them into compliance. The PY2018 Improvement Plan is considered closed following this review.

Findings

None.

Conclusions

Pennsylvania is compliant with Metric 10, because all FCM inspections were performed within the required NTE 24-month interval, with the exception of any documented 1-month delays.

Compliance determinations were discussed with the State Program Manager on 12/7/2018. Division leadership were briefed on 12/17/2018.

Recommendations

None.

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

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State Pennsylvania

Review Year PY19

There have been no changes since the preliminary determination.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	11 - Inspection Frequency - Frequency Criteria			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

For the Minimum-level assessment of Metric 11, the Division performed the following review activities:
• Reviewed MAR11 Summary for indication of any new deficiencies and compared trends to previous year MAR11.
• Assessed based on previous review results and on the reviewer's knowledge and awareness of inspection interval policies, procedures, and program.
•

Observations

MAR11 GENERATION:

HIBS National Bridge Inventory Engineer accepted the PennDOT data submittal on 5/31/2018. The Division generated MAR11 on 6/12/2018. The Division completed review by 11/29/2018.

MAR11 MINIMUM-AL REVIEW:

For the Minimum-AL review of MAR11, the Division reviewed and resolved any inspections indicated as overdue. The Division reviewed and resolved any underwater (UW) or fracture critical member (FCM) inspections that were shown as exceeding the reduced interval +1 month.

MAR11 initially flagged 10 Other/Special inspections as overdue. All 10 had been properly inspected per PennDOT policy, with one of the following explanations for the apparent overdue inspection: bridge had been rehabbed and no longer required reduced interval inspection per policy; bridge had received proper inspection with an error in the submitted date; bridge had received mid-interval inspection to move inspection date between seasons; an inspection wasn't accepted at the time of the last submittal.

MAR11 initially flagged 70 FCM inspection intervals that appeared to exceed the coded reduced interval inspection frequency or were overdue. All of these were reviewed and resolved, and all had been inspected per PennDOT policy with one of the following explanations for the apparent late inspection: bridge is closed and out of service (12 occurrences); bridge has been rehabbed or replaced and no longer requires reduced interval FCM inspection per policy (9 occurrences); bridge has had reduced interval FCM performed on time, with an error in the submitted date field (10 occurrences); bridge had reduced interval FCM performed on time but a previous inspection wasn't accepted at the time of the 2017 submittal (39 occurrences).

MAR11 initially flagged 38 UW inspection intervals that appeared to exceed the coded reduced interval or were overdue. All of these were reviewed and resolved, and all had been inspected per PennDOT policy with one of

the following explanations for the apparent late inspection: error in coding inspection as an UW inspection (2 occurrences); error in date submitted (1 occurrence); error in coding UW frequency (6 occurrence); rehab such that the bridge no longer requires reduced interval UW inspection (1 occurrence); all substructure units were able to be waded/probed/fully inspected due to water level on previous routine without dive (28 occurrences).

PREVIOUS REVIEW RESULTS AND TRENDS:

The Division assessed PennDOT as Substantially Compliant with Metric 6 for the review years prior PY2018. The primary issue identified in the PY2017 inspection were bridges that required reduced interval inspection but were not coded to receive them. The Division last reviewed Metric 11 as the Intermediate-AL in PY2018. Based on full MAR resolution during that review, the Division assessed PennDOT as Compliant.

The Division also performed supplemental analysis on all bridges in the inventory to identify any bridges that met the reduced interval criteria but were not coded to receive that; all bridges were determined to have received the proper inspection interval, with some minor errors in coding inspection frequency for the NBI submittal. This analysis was not performed for the minimum level assessment in PY2019. The Division additionally developed a random sample from the Metric 11 population (including Damage and In-Depth inspection types as well as reduced interval FCM, UW, routine, and Other Special) to perform a file review to determine if each bridge received the proper intensity of inspection, as well as the correct interval. The file review

To identify any potential trends to the previous Intermediate-AL review, the PY2019 MAR Assessment Level was compared to the PY2018 MAR.

PY2018 MAR11 flagged 90 FCM inspections overall; PY2019 MAR flagged 102. As documented above, any overdue or FCM inspections greater than the identified frequency were resolved for the PY2019 MAR with no issues identified with the reviewed bridges.

PY2018 MAR11 flagged 63 UW inspections overall; PY2019 MAR flagged 65. As documented above, any overdue or UW inspections greater than the identified frequency were resolved for the PY2019 MAR11 with no issues identified with the reviewed bridges.

PY2018 MAR11 flagged overall 754 Other/Special inspections; PY2019 MAR 11 flagged 700. Based on previous year review results and no apparent trends or new deficiencies identified in spot checks, these 700 were not reviewed for the minimum level assessment.

PENNDOT POLICY- LEVEL OF INSPECTION AND FREQUENCY CRITERIA:

The following is the PennDOT policy pertaining to maximum inspection frequency intervals:

1. Publication 238, Table IP 2.3.2.4-1 indicates the maximum interval of inspections. Reduced interval of 12 months is required for any of the following reasons: weight restriction (load posted, 1 truck at a time, etc); Condition Rating of 3 or less for a superstructure without FCMs, substructure, or culvert component; or Condition Rating of 4 or less for a superstructure with FCMs; any SD masonry arch; or any bridge with a scour rating less than 3 (likely duplicative requirement here since Item 113 of 1 or 2 necessitates Item 60 to be a 1

or 2 respectively). Reduced interval of 6 months is required for any of the following reasons: Condition Rating of 3 or less for a superstructure with FCMs; any temporary structure; or any structure with temporary supports, falsework, or cribbing.

When a reduced routine interval is required, PennDOT current practice is to continue to code Item 91 as 24 months, and to capture the mid-interval inspection as an Other/Special inspection under Item 92C. This makes sense for routines because many times the scope of the mid-interval inspection is reduced. For example if the substructure is in good or fair condition and the superstructure is in poor condition, the 12-month inspection might only look at the superstructure. Reduced FCM inspection frequency is indicated in the coding of Item 92A. PennDOT policy requires qualified Team Leaders for reduced frequency inspections, even when coded using the Other/Special inspection type. This is different than what is required under the NBIS, where Other/Special inspections are not required to have a qualified Team Leader present.

2. Publication 238 Table IP 2.6.2.4.1 indicates the maximum interval of underwater inspections, based on what PennDOT calls the Scour Critical Bridge Indicator Rating (SCBI), which corresponds to the NBI Item 113. UW reduced frequency interval of 24 months is currently required when SCBI is a 6, 4, or 3, and a frequency interval of 12 months is required when the SCBI is a 2, 1, or 0. This table and guidance in Publication 238 is currently being updated. Per Publication 238, an UW inspection is also required to be performed for bridges with a SCBI of 6 or <5 after high water events.

3. Publication 238 Section 2.3.3 establishes the scope, intensity and frequency of Damage Inspections. PennDOT policy requires that the scope be "sufficient to determine the need for emergency load restrictions or closure of the bridge...and to estimate the level of effort necessary to accomplish repairs." This should be done in such a manner that the documentation can be used later, if necessary, to re-coup costs of inspection or repair from the party responsible for the damage. Frequency is as-needed.

4. Publication 238 Section 2.3.4 establishes the scope, intensity, and frequency of In-Depth Inspections. PennDOT policy speaks in broad terms about what constitutes In-Depth inspection, and when one should be conducted. Policy is broad to allow for bridge-specific In-Depth inspections to be scheduled on a risk-based, individual basis. Key language under frequency is that an In-Depth "...[does] not reduce the level of intensity for Routine [NBI] Inspections..." Frequency is on an as-needed basis, but Publication 238 urges for complex and for bridges representing large capital investment, that In-Depth Inspections be scheduled routinely.

PennDOT codes bridge inspections as follows: There is a check box for "inspection required" for the various inspection types (Routine, UW, FCM, and Interim/other). The box is automatically checked for Routine on all bridges. When checked for FCM, UW, or Interim/other, this will code "Y" to the first digit of Item 92A, B, or C as appropriate. There is a field for "required frequency" for each inspection type. If "inspection required" is checked, they will code the corresponding "required frequency" to the second and third digit of 92A, B, or C as appropriate. There is a check box for "inspection performed" on each inspection. When checked for FCM, UW, or Interim/other, this will code the date of that inspection to Item 93 A, B, or C as appropriate.
Previously the"inspection required" and "required frequency" check boxes were left up to the inspector to check on each inspection. This led to errors as inspectors may have misinterpreted policy. PennDOT is currently providing some level of automation to these fields, with override possible by the inspection reviewer. Inspectors are still expected to check "inspection performed" accurately, reflecting what inspection was

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performed in the field.
Refer to PY2018 Metric 11 Attachments, document numbers 11510 and 11511 for the referenced chapters of PennDOT policy (Publication 238) and most recent policy memorandum updating the Pub.
Internal Tracking:
PennDOT documents reasons for delay in the inspection notes section of the bridge inspection. PennDOT Central Office will also document any delays in inspection in their monthly "M1" report process. The M1 report is a monthly report run on production data that flags any overdue inspections and provides districts with a list of all upcoming inspections. The M1 report also serves other purposes, such as verifying that the correct inspection frequency is coded.

Findings

None.

Conclusions

Pennsylvania is compliant with Metric 11, because all levels of inspection and frequency criteria are established, and all bridges indicated the appropriate level of inspection and frequency in accordance with the established criteria.

Compliance determinations were discussed with the State Program Manager on 12/7/2018. Division leadership were briefed on 12/17/2018.

Recommendations

None.

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes effecting compliance status since the preliminary determination.

As of 1/22/2019 the Division, with HQ Senior Bridge and Tunnel Engineer's concurrence, approved the PennDOT 48-month routine inspection interval criteria. Approval letter and summary of PennDOT criteria has been attached in the attachment library associated with Metric 6. Note the change to PennDOT policy (publication 238) is being developed; therefore, PennDOT is not utilizing 48-month interval yet.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	12 - Inspection Procedures - Quality Inspections			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 12, the Division performed field reviews of a random sample of bridges, sampled using the Headquarters NBIP Sampling Tool (LOC80%, MOE15% sample size). The Division compared inspection reports for all appropriate inspection types with actual field bridge conditions to evaluate the accuracy of component condition rating codes; use by the inspection team of the appropriate AASHTO Manual for Bridge Evaluation procedures; adequacy of documentation and appropriate justification of component condition ratings; whether there is an indication that a qualified Team Leader was present at each inspection; and whether there is an indication that qualified underwater dive inspectors performed any underwater inspections. The Division assessed based on the results of the field reviews.

For PY19, the review used a geographically filtered population, reviewing PennDOT Districts 8, 9, and 10 (Western Central PA). The current plan for review is as follows (see document library for a map of the PennDOT Districts, it is associated with PY2018 Metric 1 FSM):
PY18: Districts 4, 5, 6
PY19:Districts 8, 9, 10
PY20:Districts 1, 2, 3
PY21:Districts 11 and 12
PY22:Entire state.

3 bridges (BRKEY:21467, 37536, 381) were manually removed from the random field review sample with BSE concurrence. All three were closed at time of selection, and were replaced because they had been verified as being demolished by the time of field review.

Observations

FIELD REVIEW TEAM:

PennDOT was asked to participate in the field site visit and in the review of the inspection reports. The field review team was composed of two participants from the State Highway Department, Michael J. Winslow P.E. BMS2 Manager, and Doug Knoll P.E. District 8 Bridge Engineer; as well as the FHWA North Section's Senior Bridge Safety Engineer, PA Division Bridge Engineer and the Assistant PA Division Bridge Engineer. Michael Winslow and Doug Knoll were not members of the teams that conducted the recorded inspections under review. The field review team participants provided their input on the inspection condition ratings, the condition rating justification, and narrative comments reviewed.
After the field review, all Team Leaders indicated on the most recent reports were reviewed to ensure they were current PennDOT Certified Bridge Safety Inspector (CBSI) at time of inspection.

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State Pennsylvania

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RANDOM SAMPLING:

• The Division geographically filtered the population of bridge as described in Extent of Review. For PY2019, the Central-Western part of the state was reviewed, PennDOT Districts 8, 9, and 10.
• From this filtered population of 3586 bridges, the Division ran the NBIP Sampling Tool v19.1.1 to select a 19-bridge field review sample. 3 bridges were substituted with BSE concurrence as described in Extent of Review.

FIELD REVIEW RESULTS:
• For 19/19 bridges reviewed, the recorded NBI ratings and Inspection Report ratings for Items 58, 59, 60, and 62 were within the acceptable tolerance (+/-1 rating) of the FHWA field review rating and compliant.
• For 19/19 bridges reviewed, all notable deficiencies were identified and quantified, and the narrative under the items supported the item rating.
• For 19/19 bridges reviewed, there was a qualified Team Leader performing the most recent inspection, as indicated by the inspection report. All Team Leaders were cross checked in the PennDOT Bridge Inspector Training Catalog and determined to meet the PennDOT training qualifications. For PE Team Leaders, PE licenses were verified. For non-PE Team Leaders, no interviews were conducted to determine if they had 5 years of experience; however, all had received their CBSI certification more than 5 years ago, or 4 years ago for EITs.
• 2/19 Bridges (BRKEY: 21155, 37530) failed to follow MBE procedures. The bridge inspection report for 21155 noted “inspection conducted from ground”, and neoprene pads were “difficult to see from ground”. The bridge inspection report for 37530 noted that the NBI inspection was performed from the ground, but boat access was required for spans 2-4, and no follow up inspection was performed.
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Findings

2/19 bridges were found to have deficiencies in following MBE procedures which exceeded the 90% threshold for compliance. There were no additional findings.

Conclusions

Pennsylvania is substantially compliant with Metric 12, because at least 80% of the bridges field reviewed met criteria for the component condition ratings, the documentation of deficiencies, and the following of applicable AASHTO MBE procedures; and all bridges reviewed had a qualified Team leader on site during all most recent inspection types, as indicated by the report.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

An improvement plan is under development and will be attached to the 3/31 final summary.

Recommendations

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Final Summary of Metric

State Pennsylvania

Review Year PY19

PENNDOT will inform the inspectors of the findings, and include the topic in upcoming inspector refresher training.

Dec 31 Compliance SC

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

No change in compliance determination from 12/31.

Improvement plan has been developed with PennDOT and reviewed by BSE. IP is attached in documents library and an entry created on dashboard.

Mar 31 Compliance SC

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State: Pennsylvania | Review Year: PY19

State: Pennsylvania | Review Year: PY19 | Assessment Level: Min

Metric Name: 13 - Inspection Procedures - Load Rating | Prior Year Compliance: C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 13, the Division performed the following tasks:

• Generated MAR13 on 6/12/18.
• Reviewed MAR13 for any indication of new compliance deficiencies, and resolved any flagged compliance deficiencies.
• Assessed based on prior review results, the status of any new compliance deficiencies, the MAR13 snapshot, and the Division bridge staff's knowledge and awareness of State load rating practices.

Observations

PREVIOUS REVIEW RESULTS:
This metric was reviewed at the Intermediate level in PY17, including some extra review of local owner load ratings and some additional field reviews. Of the 38 bridges reviewed, all had load rating SI&A data submitted to the NBI; all had documentation of assumptions, calculations, and methodology in either the online electronic bridge file (linked from the PennDOT bridge management system) or in a hard copy file in the District office; and all were rated utilizing the appropriate PennDOT procedures, either utilizing PennDOT analysis software or using the appropriate engineering judgment procedures for concrete bridges with unknown bar layouts documented and accepted in Publication 238.

For state owned bridges as well as some other agency bridges on state routes, PennDOT utilizes an in-house automated permit routing analysis software (APRAS). This includes an analytical automated bridge analysis software (ABAS), which can run HS-20 equivalent moment comparisons based on HS-20 moment comparison factors as well as being able to utilize PennDOT load rating software data files (BAR7 and the LRFD programs). For bridges on state routes previously reviewed in PY17, all either had software models and/or moment comparison factors that are reasonably close to the most recent load rating and SI&A data. It doesn't necessarily need to be identical, since the SI&A data is based on LRFR/LFR whereas other rating methods are acceptable for permit evaluation.

Review of the load rating is in the scope of all PennDOT inspections. Re-rating is recommended as necessary. Load ratings are QA'd as a part of the state inspection QC/QA program, by having the state QC/QA consultant perform blind ratings on the QC/QA sample bridges. Additionally, Central Office runs quarterly data quality checks as recommended in the process reviews, to which the Districts respond and make changes.

SHVs:
PennDOT submitted a parametric study that demonstrated all AASHTO SU vehicles are enveloped for simple and

continuous bridges of any given length by the PennDOT load rating vehicles. PennDOT had identified many years ago that SHV-type vehicles were legal under their motor vehicle code and developed a load rating vehicle they call the TK-527. The parametric study was reviewed and accepted by Lubin Gao and the Division. The parametric study is attached along with an addendum addressing Lubin/Division comments.

FAST Act Emergency Vehicles:
PennDOT previously submitted a POA in March 2017, in accordance with the HQ memo, to load rate bridges for the EV vehicle types that were exempted under the FAST Act. PennDOT has done significant analysis/screening on the Interstate system for the EVs utilizing ABAS, and has narrowed down the population of bridges requiring further analysis to fewer than 100, all of which were completed by the end of 2018. No Interstate bridges need to be posted for EVs. The POA was reviewed by the Division as well as Lubin Gao and the BSE.

Pennsylvania is one of the states where the EVs are likely exempted under state motor vehicle code, and therefore likely will need to rate the entire inventory by 2022. The POA reflects an action for rating of the entire inventory by this date. The latest POA update is attached.

MAR RESOLUTION:

- MAR13 initially flagged 149 potential load rating compliance issues.
  - MAR13 Report 3 looks at whether each bridge is load rated, based on Item 63 =/= 5. Report 3 flagged 21 bridges.
  - § 17 of 21 bridges were accepted with the incorrect information, and have been updated with valid load ratings in BMS2
  - § 1 of 21 bridges is a temporary structure and is coded in accordance with specified guidelines.
  - § 3 of 21 Bridges had item errors and were updated with corrected rating sets.
  - MAR13 Report 3a looks at whether the LR in the NBI are reasonable. If inventory rating is the same as operating rating, this would flag as unreasonable. Report 3a initially flagged 92 bridges. Of these, 1 was a border bridge with NJ oversight that appears to be rated LFD, but it is unclear why IR=OR. 1 is a stone masonry arch that is only evaluated at inventory per MBE 6B5.2.6. The remaining are cases where the OR and IR are both >99T, but there is a known metric conversion issue with the state submittal where sometimes the stored 99 T gets converted (to 89.8 mT). Sometimes it doesn't do this conversion.
  - MAR13 Report 3b looks at whether an assigned load rating is allowed (design is HS-20 or greater and LFD/LRFD). Report 3b initially flagged 36 bridges, 3 of these were recently rehabbed and were designed to full HL-93. The issue is that Item 31 doesn't get updated when the new load rating is coded into BMS2. PennDOT made this an error in BMS2 in PY18, so this issue will continue to diminish in the future. 18 bridges had an inventory rating error corrected. 12 bridges had a design vehicle error and load rating method error corrected. 2 bridges had an item 63/65 error corrected. 1 bridge had a design vehicle error corrected.
- After resolution and overrides as described above, the MAR13 snapshot indicates compliance.
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Findings

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Final Summary of Metric

State Pennsylvania

Review Year PY19

NA

Conclusions

Pennsylvania is compliant with Metric 13, because all higher and lower risk bridges have a load rating in accordance with the AASHTO MBE, and all reviewed higher and lower risk bridge load ratings were accurate for the current conditions.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

NA

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	14 - Inspection Procedures - Post or Restrict			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 14, the Division performed the following review activities:

• Generated MAR14 on 6/12/18 (Note all MARs were regenerated on 6/12/18 using the updated MARGen program).
• Reviewed MAR14 for any indication of new compliance deficiencies, and resolved any flagged compliance deficiencies.
• Assessed based on prior review results, the status of any new compliance deficiencies, the MAR14 snapshot, and the Division bridge staff's knowledge and awareness of State load rating practices.

Observations

PREVIOUS REVIEW RESULTS:

• Metric 14 was last assessed at the Intermediate level in PY2017, and Pennsylvania was determined to be compliant. For all bridges in the file review sample, the Division found pictures of the posting in the bridge file, in at least the most recent inspection report; the Division determined the posting was consistent or more conservative than the most recent load rating; the Division determined Item 41 was correctly coded on the most recent NBI submittal. 15 bridges from the file review sample were included in PY17 field reviews, and no issues were noted with the posting signage or advanced posting signage in the field.

• For many years PennDOT had issues with consistently coding Item 70 correctly. The state has now automated the calculation of Item 70 based on the load rating data stored in BMS2 compared to the state legal loads. This solved a majority of the issues with Item 70, but did introduce one known error.

• The PennDOT ML-80 load rating vehicle has a gross weight of 36.64 Tons. The PennDOT bridge management system BMS2 inventories the IR and OR tonnages (not rating factors) without decimals. Following good practice, one would not round anything less than 37 up to 37. Therefore a bridge may rate for 36.8 Tons for the ML-80, but the operating rating would be truncated in BMS2 to 36 T. This would trigger Item 70 to automatically code as a 4, since 36 T is less than 100% of that maximum legal load. PennDOT is looking at ways to implement a work around for this, but this remains an issue that shows up on the MAR. The Division has recommended looking at storing at least one decimal, since the NBI items are coded to the tenth, but this may not be feasible with the current database.

• Enforcement of posting continues to be a risk area for Pennsylvania, as also identified by NBIPOT.

NBI ERROR/SAFETY CHECKS:

• No load capacity/posting errors were generated by the 2018 NBI Submittal. All issues on the MAR were resolved (see below).

MAR14 REVIEW AND RESOLUTION:

REPORT 1:
-MAR14 report 1 determines whether the operating rating is less then 20 mT while the bridge remains open without restriction (Item 41 = A. An Operating Rating (Item 64) less than (<) 20mT is a reasonable indicator that posting is required. The low 20mT threshold used allows for variances between HS/MS/HL-93 ratings and the many State legal load configuration ratings. This report flagged 17 bridges. All 17 bridges were missing item 64 information. Also, 2 of 17 bridges had an incorrect item 70. The data was corrected, and posting was not required on the bridge. 15 of 17 bridges had updated rating sets, and were correctly posted. The data was corrected to reflect the most current rating set.

REPORT 2:
-MAR14 Report 2 determines whether bridges with a posting evaluation (Item 70) is less than 5, meaning the operating rating is below the state's maximum legal load, are posted as indicated by Item 41. This report flagged 75 bridges. 1 was a NJ border bridge owned by Delaware River Port Authority and referred to the NJ Division for follow-up. NJ determined bridge was compliant, coordination with PennDOT posting vehicles is ongoing. 29 bridges had revised load ratings that show an operating rating greater than the state's maximum legal load; 3 bridges had a posting implemented; 3 had data errors but were properly posted; 39 had errors in the coding of Item 70, as described above.

REPORT 4:
-MAR14 Report 4 flagged 0 bridges.

REPORT 5:
-MAR14 Report 5 determines whether bridges with a super, sub or culvert rating of 1 or less, as indicated by Items 59, 60, and 62, are closed as required, as indicated by Item 41. This report flagged 19 bridges. All 19 of were PennDOT hybrid bridge/culvert structures, for which PennDOT submits a deck, super, sub, and culvert rating. Most often these are bridge structures widened using a culvert, or vice versa, and PennDOT has used the practice of submitting the deck, super, sub, and culvert rating for many years. None of these had a condition rating of 1 or less for Item 59, 60, or 62, so these flagged erroneously due to the report logic not knowing what to output when a structure has a condition rating submitted for 59, 60 and 62, which is uncommon (arguably not correct, but again long standing PennDOT practice). These also flag on the NBI submittal error check, and the FHWA has considered these exceptions for the purposes of error resolution.

REPORT 6:
-MAR14 Report 6 determines if a bridge is closed as required by looking for an operating rating less than 2.7 mT. An Operating Rating (Item 64) less than (<) 2.7mT requires closure. Temporary conditions (Item 103) are considered. This report flagged the same 17 bridges that were flagged in Report 1, and the resolutions remain the same. All 17 bridges were missing item 64 information. 2 of 17 bridges had an incorrect item 70. The data was

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corrected, and posting was not required on the bridge. 15 of 17 bridges had updated rating sets, and were correctly posted. The data was corrected to reflect the most current rating set.
REPORT 1a:
-MAR14 Report 1a determines whether a bridge with an operating rating between 20 and 32.4 metric Tons is posted, as indicated by Item 41. This report flagged 4 bridges. Of these, 2 had posting implemented and item 41 updated. 1 had load rating data updated, with IR and OR greater than 32.4 mT. 1 had the rating set revised and is properly posted.

REPORT A:
-MAR14 Report A looks at whether bridges with the design vehicle reported as H10 or H15, as indicated by Item 31, are posted. Report A flagged a large number of Pennsylvania bridges, 603. The Division has the knowledge and awareness, from review of MAR13, that there have been issues in incorrectly inventorying Item 31 in the past. Report A was not resolved in PY2019 since it is not required on minimum level assessments. Report A was analyzed in some detail in PY2017.
In PY2017, the Division broke down the construction date range, under the assumption for anything designed post-1950, it would be highly unlikely to be H10/15. For bridges designed post-1950, especially the >100 built post-2000, the Division found it highly likely these are Item 31 errors (which is a documented issue under Metric 13). For pre-1950 designs, the Division reviewed 189 bridges, determining that all had reasonably recent documented load ratings. The Division did not identify any bridges of concern among the 189.

After the resolution and overrides as described above, the MAR14 snapshot indicates Compliance.

Findings

N/A

Conclusions

Pennsylvania is compliant with Metric 14, because all bridges are properly posted or restricted, and all identified posting/closing compliance deficiencies are promptly resolved.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

N/A

Dec 31 Compliance C

Dec 31 Summary Complete ☑

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Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	15 - Inspection Procedures - Bridge Files			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 15, the Division assessed based on prior review results and the Division bridge staff's knowledge and awareness of State bridge file policy and practices.

Observations

PREVIOUS REVIEW RESULTS:

- This metric was assessed at the Intermediate-level in PY2016. Prior to PY2016, this metric had been assessed substantially compliant, with an IP in place, due to some bridges missing channel cross sections in the previous reviews. The PY2016 review included Intermediate-AL random sampling, and for the random sample all applicable significant bridge file components described in metric commentary were present either in the Electronic Document Management System (EDMS, which links to BMS2), or readily available in the District for files.
- PennDOT is currently finalizing a new addition to Publication 238, which will cover the measurement and documentation of scour. The Division performed a program review of the PennDOT Hydraulics and Hydrology program in 2015. A recommendation out of this review was for PennDOT to perform more frequent channel cross sections. To address this recommendation, PennDOT intends to set a risk-based frequency for updating channel cross sections, based on the Item 113 and Item 61 ratings, which will not exceed 60 months.
- For additional knowledge and awareness, the Division had no issues locating all applicable file components that are field verified for the field review sample this year (reports, waterway information, procedures, load rating, posting, critical findings, scour assessment and POA). All file components were available in EDMS for state/local bridges. File components for the Turnpike bridge reviewed were provided by the PTC upon request.
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Findings

N/A

Conclusions

Pennsylvania is compliant with Metric 15, because all sampled bridges had files, and all files had the applicable significant components.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

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Final Summary of Metric

State: Pennsylvania

Review Year: PY19

Recommendations

N/A

Dec 31 Compliance: C

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

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Final Summary of Metric

State: Pennsylvania | Review Year: PY19

State: Pennsylvania | Review Year: PY19 | Assessment Level: Min

Metric Name: 16 - Inspection Procedures - Fracture Critical Members | Prior Year Compliance: C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 16, the Division assessed based on prior review results and Division bridge staff's knowledge and awareness of the State's fracture critical member inspection policy and practices.

Observations

PREVIOUS REVIEW RESULTS:

-This metric was assessed at the Intermediate level in PY2016. Based on field and file reviews conducted in that year, the Division determined that all the reviewed FCMs had the locations of all FCMs identified, inspection frequency outlined, and adequate procedures for the FCM inspection.

-PennDOT Publication 238 (Bridge Safety Inspection Manual) Section 2.4.5.1 provides details and guidance in the preparation of FC inspection plans, and contains many methods of conducting non-destructive testing of FC details and FC members. PennDOT does not require specific non-destructive test methods as a part of the FC inspection plans, but Pub 238 does specify what data is to be measured and recorded, and gives guidance on how the data will be used to assess the overall condition of bridge to insure that the inspector uses appropriate test methods.

Per 2.4.5.1, the following is required for all FC plans:

- A F&F Inspection Plan shall include the following:
  - Sketch (es) of superstructure with locations of all fatigue and fracture prone details identified.
  - Use grid diagram (framing plan) with detail locations labeled by letters or numbers and a legend explaining the number or letter schemes
  - Use an elevation view for truss
  - Classify similar fatigue/fracture prone details as “types” (e.g. end of partial cover plate)
  - A table of fatigue/fracture prone details indicating
    - Type of detail (e.g. end of partial cover plate, short web gap, etc.)
    - Location of each occurrence of detail
    - AASHTO Fatigue Category of detail
    - Identify retrofits previously installed
    - Table can be organized by Span or type of detail
  - Specific instructions if the Interrim inspection is of any scope less than a full hands on FCM inspection.\

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Review Year PY19

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Concrete encased FCMs have additional inspection plan requirements and require Central Office approval:

• Identify portions of encased FCMs of higher susceptibility to fracture or fatigue

  • Where encasement is fully intact, visual observation alone may be used on a frequency not to exceed 24 months when it will sufficiently ascertain the FCM condition.

  • Where encasement is not intact, hands-on inspection is warranted.

• Identify portions of encased FCMS with lesser susceptibility to fracture or fatigue.

  • Visual observation alone may be used on a frequency not to exceed 24 months if it will sufficiently ascertain the FCM condition. Otherwise, hands-on inspection is required.

• Identify portions of encased FCMs that do not warrant hands-on inspection.

• Provide photos to document condition of concrete encasement, especially at fatigue or fracture-prone details, for F&F Plan.

• Update photos during subsequent inspections.

• Provide for testing (via sounding, etc.) of encasement integrity in critical locations on an on-going basis.

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-Per Pub 100 A (BMS2 Coding Manual), PennDOT BMS2 inventories certain FC information directly into the system, pertaining to location and condition of each FCM. Item IF01 inventories which span/pier the FCM detail is located in as appropriate (for an FC super/sub respectively). IF02 inventories the type of FCM- Girder or beam, truss bottom chord, truss diagonal, cable, cross girder, etc. IF03 is a 50 character field to provide a description of the member (ex. L3-L4 LT TRUSS). IF04 is a 50 character field to describe the detail that is FC, for example BOTTOM CHORD EYEBAR, or WELDED STIFF. IF05 is the AASHTO fatigue category of the detail. IF06 is a notes field to provide detailed FCM condition information.

-Additionally, PennDOT inventories a Critical Ranking Factor (CRF) for bridges with FCMs. This item is essentially a risk prioritization of bridges with FCMs, recognizing some factors may make some FCMs more critical than others. Item 6A44 is the main span group type (for example, most critical would be group 1 bridges, 1-girder, 2-girder simple or suspended spans, simple or suspended span trusses, tied arches, suspension, and cross girder pier caps. Group 2 bridges are 2-girder continuous end spans and tension zones, continuous truss tension members, or rigid frame pier tension zones. 6A45 is the type of member detail that is FC: hanger assembly, intersecting welds, etc. 6A46 is the fatigue susceptibility based on member type and AASHTO fatigue category. 6A47 is a material factor that takes into account the fracture toughness, steel grade, and type of member. 6A48 is the ADTT for the bridge.

For knowledge and awareness, 2 bridge with FCMs was reviewed on the PY2019 field reviews. The procedures were available and adequate for an FCM inspection to be performed. It appeared the inspections had been hands on and took fatigue prone weld details into account. Condition rating of the bridge took the FCM inspection into account, but this is not usually an issue since PennDOT typically does routine and FCM inspection at the same time.

Findings

None

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State: Pennsylvania

Review Year: PY19

Conclusions

Pennsylvania is compliant with Metric 16, because all bridges with FCMs have documented inspection procedures for the FCMs, and all bridges with FCMs are inspected according to those procedures.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

Dec 31 Compliance: C

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

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Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Int
Metric Name	17 - Inspection Procedures - Underwater			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 17, the Division performed the following review activities:
1) Assessed based on prior review results and the Division bridge staff knowledge and awareness of the State's underwater inspection policy and practices.
2) Randomly sampled bridges to verify that files contained UW inspection procedures, and the UW inspection report showed that the bridge was inspected according to those procedures.
3) Included some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify documented procedures were followed.

Observations

PENNDOT POLICY/PROCEDURES

-The PennDOT Publication 238 Section 2.6 contains the policy and guidance on the general requirements pertaining to all underwater inspection. See attached in documents library under PY2019 Metric 17. Updates are being made to this section as a broader "Scour Practices" update, for more consistent documentation and measurement of scour and channel changes. Draft updates are also attached in the documents library under PY2019 Metric 17.

-Individual bridges have a significant amount of information about underwater bridge elements stored in data items in the State's BMS2 system.

-The substructure units are individually inventoried, providing information about the substructure unit type, whether UW inspection is necessary for that specific sub unit, the alignment of the sub unit to the channel, the stream velocity, sediment deposits, what material the foundation bears on, the streambed material, observed scour depth, water depth, any scour-induced movement of the sub unit, any scour/undermining indicated, and the presence of scour countermeasures at that individual sub unit. Again, all of this information is inventoried per substructure unit. There are also fields for 100yr and 500yr scour depth, where a quantitative analysis has been performed.

-The past and current determination by the Division is that these inventory items constitute written UW procedures since they contain all information necessary for an UW inspector to plan and execute a consistent quality inspection. This determination was made in PY2013 along with the BSE at the time. The last INT-AL assessment was completed in PY13, and the next INT-AL is scheduled for next year.

-Per the Metric 17 commentary paragraphs 2-4, the following are the items that are necessary to communicate on inspection procedures, and how this is accomplished in BMS2 inventorying:

• identified underwater elements- accomplished by individually inventorying each sub unit. Each unit has a drop down for routine inspections that identifies what level of inspection was able to be completed on that sub unit. For example, it could be coded as "no UW inspection required, normal inspection performed (including probing)" indicating an UW inspection of that sub unit would not be necessary. However it could also be coded as "inspection not completed- UW inspection by divers is required" indicating that the sub needs UW inspection. On an UW inspection, it would then be coded as "UW inspection performed by divers" or "probing performed by divers."

• physical scour countermeasures- identified thru Item IN21, which is a yes/no check box per sub unit, as well as identified on a "countermeasures installed" screen. Additionally may be identified on IN15/IU06- streambed material, where the countermeasure is across the channel.

• inspection equipment- equipment identified on inspection planning screen (boat, ladder, etc)

• structural details- plans in file, also each sub unit is inventoried providing whatever information is known about the unit's design. Item IN12- Pier/abut type (e.g. stub, cantilever, gravity, spill-thru, unknown, piles/bents, MSE, etc). IN13- foundation type- (e.g. spread on competent bedrock, cast in place piles, h-piles, timber piles, spread on soil, unknown, etc) Wingwalls are identified in IU13, 14, 15 and 16. IU15 for example is "Upstream right wingwall presence."

• hydraulic features and characteristics- items include those pertaining to streambed material and characteristics, water depths per sub unit, scourability of the streambed at the sub units, scour hole presence and scour hole depth, and streamflows

• inspection methods and frequencies- established by policy

• qualifications of personnel- established by policy.

• Permits or special contracting procedures- if required, there is a screen in BMS2 under "Inspection Planning" that can detail the requirement for any permits/other special actions that must be completed prior to inspection. This would include multiple fields that provide notes and contact information for POCs.

• Risk factors

  • rapid stream flows- stream flow qualitatively described by item IN11 as low medium or high. IU10 describes debris accumulation- described qualitatively by IN06- debris potential described as none, minor, medium, high, or present. This is item is per substructure unit. Additionally identified for the entire bridge utilizing items IU08- debris potential and IU09- trapping potential, rating these as low, medium or high. IU17, 18, 19, and 20 describe the presence of debris for the entire bridge. This is accomplished as a percentage where the left abutment is considered 0 and right abutment is considered 100. IU17 is the beginning point of horizontal blockage, 0 being at the left and 100 being at the right abutment. IU18 is the end point of horizontal blockage. IU19 is beginning point of vertical blockage, and IU20 is the end point of vertical blockage. For IU19 and IU20, 0 is considered the streambed and the bottom of the beam is considered 100. soft or unstable stream beds- IU06 is an overall channel streambed material. Additionally this is coded per sub unit as IN15. Some examples of streambed material would include "A6- stable alluvium with large native cobbles and boulders, small amounts of fine material filling voids" or "A3-highly erodible alluvium predominantly very small particles: clays, silts, fine sands. High scour potential." IU07 -stream bed material description, is a comment field where the inspector can describe the stream bed material further, beyond the general classification in IU06. Presence of sediment/unstable material coded per sub unit as IN09. Sediment accumulation in IN09 is described qualitatively as none, minor, medium, or high. meandering channels- Lateral stream migration is best captured by item IN10 which describes the stream alignment at or near the

structure per substructure unit.

• Typically, based on knowledge and awareness, UW inspection reports include an introductory section that detail the procedures and policies under which the inspection is performed, which is also an acceptable practice for communicating UW inspection procedures/needs.

-PennDOT utilizes two consultant agreements for a majority of their underwater inspections, with the PennDOT District 3-0 having the only State dive team. The policies and procedures for conducting underwater inspections are included in the consultant agreement contract documents as well as PennDOT Publication 238. PennDOT reviews a sample of underwater inspections as a part of their ongoing QA/QC program.

-As additionally documented under Metric 15, PennDOT is adding an appendix to Publication 238 that is a standard practices manual for measuring and documenting scour. This includes some refined information about the type of documentation expected for underwater and probing inspections.

-Documentation of PennDOT policies/procedures related to UW data item coding, as described above, is attached in the documents library. The document is an excerpt from Publication 100A (BMS2 coding guide) and is associated with PY2018 Metric 18.

FILE REVIEW:

18 Bridge files were selected by the Headquarters-provided sampling tool for review. All bridge files were considered complete. Where the most recent inspection reports were missing from the BMS2 database, PENNDOT was able to promptly acquire them from PTC. All reviewed UW inspection procedures were properly documented in BMS2 as outlined above.

One finding pertaining to the assessment of Metric arose from the knowledge and awareness gained by the reviewer from the Metric 17 file review. All UW inspections were performed by qualified inspectors, but there was no identification of the individual UW inspectors in the reports. All 18 inspection reports exhibited the same finding. All UW inspections are performed either by one of two statewide open end consultant agreements, or, in the case of PennDOT District 3, by an in-house dive inspector. Therefore, review can confirm who all the divers are, either internal or by the staff identified on the consultant agreement; however, information as to the individual divers (if not the inspection TL) is not readily available in the bridge file or inspection report.

FIELD REVIEWS:

1 bridges from the intermediate-level file review was included in the field review sample by the Headquarters-provided sampling tool. Additionally, there were 16 bridges in the field review sample over water, to add to reviewer knowledge and awareness. 4 of these 16 had UW dive inspections.

There were no findings pertaining to underwater inspection reports from the field review. It appeared from review of the UW inspections that they had been properly performed when applicable, and the results of the UW inspection had been incorporated into the routine inspection condition ratings as appropriate. For the 1 bridge from the intermediate-level file review sample, no issues were found with coding of Items 38, 111, 39, 40, or 116.

U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Final Summary of Metric

State: Pennsylvania

Review Year: PY19

Findings

None

Conclusions

Pennsylvania is compliant with Metric 17 because all bridges requiring UW inspection have procedures, and all bridges requiring UW inspections are inspected according to these procedures.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

None

Dec 31 Compliance: C

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Int
Metric Name	18 - Inspection Procedures - Scour Critical Bridges			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

For the Intermediate level assessment of Metric 18, the Division performed the following review activities:

- Reviewed MAR18 Summary and resolved previously identified unevaluated bridges.
- Assessed based on previous review results, the status of any new compliance deficiencies, and from the Division's knowledge and awareness of the PennDOT scour processes and practices.
- Randomly sample bridges to review files and verified scour evaluations are documented, consistent with bridge conditions, and properly assess scour vulnerability.
- From the random sample, verified that POAs are developed and documented for those that are scour critical or have unknown foundations.
- Included some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify validity of scour evaluations. Note-field review sample is now generated using HQ-developed random sampling tool; field review sample population geographically filtered to PennDOT Engineering Districts 8, 9, and 10. Sampling tool automatically includes some bridges from Metric 18.
- If a triggering event has occurred to a sampled bridge during the 2-year period prior to the year of assessment, attempted to verify whether monitoring had occurred in accordance with POA.
-

Observations

REVIEW OF PENNDOT POLICY

Scour Evaluation and Assessment:

Publication 238 IP 2.6.3 lays out requirements for the scour assessment of bridges. 2.6.3.1 specifies that there are two acceptable methods of performing scour assessments, theoretical scour calculations (H&H analysis) or an observed scour analysis utilizing PennDOT Observed Scour Assessment for Bridges (OSAB) methodology.

Per Publication 100A, PennDOT collects information at the substructure-unit level for substructure condition and waterway condition. Waterway information collected pertinent to the scour assessment includes:

- Changes since Last Assessment (Item IN04)- qualitatively characterizes any changes in streambed/scour since last inspection. Negative changes characterized as none, minor, medium and high. Improvements carry coding from 9 (resolved all problems), 8 to 5 (improvements solved some issues), 4 (inadequate repairs), or 3 (repairs failed or worsened issue).
- Scour Hole (IN05)- characterizes the presence of scour found through visual and probing as none, minor, advanced or serious.
- Abutment Type (IN12)- numerical coding corresponding to the abutment type (stub, cantilever, masonry, etc) or pier type (timber, steel, concrete, masonry, other) for the sub unit.

• Foundation Type (IN13 and IN14)- coding corresponding to footing type for the sub unit (spread, steel h-piles, etc).
• Streambed Material (IN15)- coding describing the natural or improved streambed at the sub unit. Coding is broken into countermeasure/paved, bedrock, or alluvium. Examples of two available alluvium codings, see attached Pub 100A for remaining coding options:
  • A6- stable alluvium predominantly larger native cobbles and boulders (not riprap) with small ammts of fine material filling voids. Deeper holes may exist mid-chanel. Only minor scour near sub unit.
  • A3- Highly erodible alluvium, predominantly very small particles: clays, silts, fine sands. High scour potential at all water velocities. Advanced scour may be present or have occurred in the past.
• Movement Indicator (IN19)- a checkbox (yes/no) indicating whether the sub unit displays any movement (ie rotation, settlement).
These items are coded by the inspector, per substructure unit, at each inspection. Each substructure unit is then assigned a Scour Critical Bridge Indicator (SCBI) (IU27) code, based on the Item 113 coding language. For example, one case that returns an 8 would be:
• Minor or no scour changes (IN04)
• Minor or no scour hole (IN05)
• For any substructure type (IN12)
• Founded on piles (IN14)
• with stable streambed material (IN15)
Another example is that any time the movement indicator is checked (IN19) this automatically will return a 2, since the movement, if due to scour, could be indicative of instability.
Refer to attachment "Scour Calculator Codes" under PY2019 Metric 18 for the full input/output for all scour cases.
This documented process for observed scour analysis is per policy the only acceptable means of coding Item 113 aside from an H&H/HEC18 scour analysis. Therefore, for purposes of this review, the Division considers this to be a documented process for observed scour assessment and fulfills the Metric requirements.
Documentation of policy/procedures described above is attached in the documents library under PY2018 Metric 18, excerpts from Publication 100A and Publication 238 pertaining to Scour evaluation and PennDOT data item coding.
Scour Plans of Action:
Publication 238 IP 2.6.4 lays out requirements of scour POAs. PennDOT prioritizes scour based on Items 4A08 (NBI Item 113) and Item IN03 (an observed scour assessment, somewhat analogous to Item 113, but coded per substructure unit). Scour Category A bridges include 4A08=2 or IN03<4. Scour Category B bridges include 4A08=3 and IN03=4. Scour Category C bridges include 4A08=3 and IN03 of 5-7. Scour Category D bridges would be anything with a 4A08>3 (non-scour critical). Category A-C are all considered scour critical per NBIS and require a scour POA.
2.6.4.1 lists resources available to aid in monitoring during storm events, including GIS maps, a separate field manual for scour monitoring/inspection (appendix to Pub 238), and weather resources. PennDOT is continuing to implement Bridge Watch as well.
2.6.4.2 lists monitoring requirements and recommendations. Scour monitoring for department force is also covered under Publication 23 (Bridge Maintenance Manual) chapter 9-Emergency Operations, laying out requirements for monitoring before, during and after flood events. 2.6.4.3 contains requirements for post flood

inspections, and 2.6.4.4 contains reporting requirements.
These sections of Publication 238 are attached in the documents library under PY2018 Metric 18.

MAR18 RESOLUTION:

MAR18 did not flag any bridge records with Item 113= 6, U, or T.

INTERMEDIATE FILE REVIEW:

The Division generated the Intermediate-AL file review sample utilizing the Headquarters-provided sampling tool. The following items were reviewed and documented on the field review forms provided by Headquarters:

- Whether a scour evaluation is in the bridge file, and if that evaluation is appropriate (ie state bridges designed after 1991 have scour calculations/H&H report; others may have an observed assessment in accordance with the above described procedure; if a 7, should have some type of H&H performed). Observed assessment input data was reviewed for reasonableness.
- Whether Item 113 coding matches the assessment.
- For scour critical bridges, whether the POA has been developed and implemented.
- For scour critical bridges, attempted to determine if a triggering event has occurred within the last 2 years (as review was conducted in October 2018, this was taken as CY 2018, 2017, and 2016), and if there was documentation of intra-flood and post-flood monitoring.
    - For the 3 scour critical bridges in the sample, potential triggering events were identified for Summer 2018, but not for 2017 or 2016.
    - This determination was conducted by asking the responsible state personnel, but also the Division attempted to independently identify/confirm using the information on the POA, Stream Stats, and Weather Underground historical data.

Refer to the file review summary, attached in the document library under PY2019 Metric 18, and the file review forms, attached in the document library under PY2019 Metric 17.

Generally speaking, the Division determined all bridges had scour evaluations per state requirements. The Division found minor issues with 1 observed scour evaluation from the sample, which had recently had changes to the streambed material (IN15) for one abutment, resulting in the change in Item 113 coding from a 5 to a 3. This bridge spans a lake controlled by a reservoir, so water level is essentially constant. Inspection notes indicate presence of a large amount of fine silt at one abutment, through which the underwater inspector concluded they were probing the footing. Without pictures of the stream bed material and without performing a field review ,it is difficult to say definitively whether the 5 or 3 is a more accurate coding; however, this is indicative of one possible weakness in the PennDOT observed scour assessment process. The scour coding generated is very sensitive to changes in the streambed material item (IN15), which may be difficult in some cases for the inspector to code accurately.

All 3 scour critical bridges in the sample had POAs in place. The POAs generally met PennDOT policy. 2 of the 3 bridges did not have triggering events in 2016, 2017, or summer 2018. As described above, one is over a lake and does not see much variation in flow. 1 (BRKEY 21467) had been demo'd by summer 2018 when most parts of the state saw triggering events. The third, BRKEY 32727 is a locally owned bridge that the Division is reasonably sure had a triggering event in summer 2018. There is documentation in the bridge file that the bridge received post-flood inspections after 2 events; however, there is not documentation of the monitoring that occurred during the flood event. Per the POA, the bridge is to receive monitoring during any flood events in the watershed at a frequency of 12 hours. Based on discussions with the state personnel responsible for oversight, and their discussions with the local owner, it is likely that monitoring occurred and that the road was closed due to flooding

of approaches/other locations during some or all of the event. The bridge and roadway are considered very low risk, local low-volume.

FIELD REVIEW:

In total, 16 bridges field reviewed were part of the Metric 18 population, including 2 from the Intermediate-AL file review sample. Field review forms may be found in the attachment library under PY2019 Metric 12. A summary of the Metric 18 field review results may be found attached under PY2019 Metric 18.

In summary, for BRKEY 14642, Item 113 was coded as a 3 but appeared to be founded on rock (coded alluvium). The bridge had recently been overtopped and did not appear to have any additional scour. While the 3 was correct by PennDOT coding based on the items coded by the inspectors, we felt a 5 could have been appropriate. For BRKEY 22902, Item 113 was coded 7, but the bridge had a paved channel as part of the original design, with no distress to the channel paving. Therefore we felt 8 would be the more appropriate coding since the paved channel countermeasure was part of the original design not to address an existing scour problem. For the remaining bridges in the Metric 18 population, the Division agreed with the Item 113 coding as observed. For the 2 field review bridges in the Intermediate-AL sample, the Division concurred with the Item 71 and 61 coding.

Findings

-All sampled bridges that are scour critical had a POA on file, but one POA had minor deficiencies that did not adversely effect POA effectiveness or public safety. The POA had incorrect information for the responsible individual, and the language about the triggering event could be clarified.

-All sampled scour critical bridges subjected to a triggering event, which was just one local bridge, appeared to have been monitored or closed and received a documented post-flood inspection. However, documentation of the monitoring that the POA prescribes during the flooding was not able to be produced by the owner.

Conclusions

Pennsylvania is substantially compliant with Metric 18, because all sampled bridges over water had a scour evaluation; all sampled bridges had documentation of the scour evaluation in the bridge file; all sampled bridges had a POA, but some POAs had minor deficiencies that did not adversely affect the overall POA effectiveness or public safety; and all sampled scour critical bridges that were subject to a triggering event were monitored, but minor deficiencies existed in the documentation.

Compliance determinations were discussed with the State Program Manager on 12/7/2018. Division leadership were briefed on 12/17/2018.

Improvement plan is being developed with the state, and will be attached to the final March 31st summary.

Recommendations

U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Final Summary of Metric

State: Pennsylvania

Review Year: PY19

Dec 31 Compliance: SC

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

No change in compliance determination from 12/31.

Improvement plan has been developed with PennDOT and reviewed by BSE. IP is attached in documents library and an entry created on dashboard.

Mar 31 Compliance: SC

Mar 31 Resolution Complete: ☑

U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Final Summary of Metric

State: Pennsylvania | Review Year: PY19

State: Pennsylvania | Review Year: PY19 | Assessment Level: Min

Metric Name: 19 - Inspection Procedures - Complex Bridges | Prior Year Compliance: C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 19, the Division assessed based on prior review results and the Division bridge staff's knowledge and awareness of the State's complex bridge inspection policy, procedures, and practices.

Observations

PREVIOUS REVIEW RESULTS:
This metric was last reviewed at the Intermediate level in PY16. The review in PY16 included field review of two complex bridges during their routine inspection. Pennsylvania does not have a large population of complex bridges, with 9 identified on the sampling tool. All field and file reviewed bridges had adequate complex bridge inspection procedures, typically most easily found in the scope of work for the consultant inspection agreements. Procedures addressed inspection procedures, traffic control, access, and hands-on inspection. None of the reviewed bridges required NDT in the inspection, but Publication 238 requires any NDT techniques should be identified in the complex procedures where applicable. None of the reviewed bridges required specialized inspector training or experience.
PennDOT policy for complex bridge inspection procedures is found in Publication 238 IP 2.3.
No changes have been made to this policy since the previous Intermediate-level review.

Findings

None

Conclusions

Pennsylvania is compliant with Metric 19, because all complex bridges have inspection procedures for the complex features and detail the additional inspector requirements as necessary, and all bridges are inspected in accordance with the established procedures.
Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

None

Dec 31 Compliance: C | Dec 31 Summary Complete: ☑

U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Final Summary of Metric

State Pennsylvania

Review Year PY19

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Min
Metric Name	20 - Inspection Procedures - QC/QA			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 20, the Division assessed based on prior review results and the Division bridge staff knowledge and awareness of the State's QC/QA policies, procedures, and practices.

Observations

PREVIOUS REVIEW RESULTS:

This metric was last assessed at the Intermediate level in PY2014.

-PennDOT has an active QA/QC program for their bridge inspection program. The policies and procedures for QA/QC of inspections are detailed in the PennDOT Publication 240, Bridge Safety Inspection Quality Assurance Manual.

-QA/QC Program Manager position is currently being covered by State Program Manager James Long, P.E. and Michael Winslow, P.E., pending hiring a new QA/QC engineer. The position has been vacant for approximately 1 year.

-The QA/QC program samples bridges in each of the PennDOT Districts on a monthly basis to check for quality of inspections, documentation, etc. A consultant performs an inspection and load rating of each sampled bridge without seeing the previous inspection reports or ratings. Any discrepancies are noted in a close-out meeting with the District. The program also reviews and evaluates the consultant inspection firms.

-The manager of the electronic bridge management system, BMS2, is Michael Winslow, P.E. PennDOT conducts a large amount of QA/QC of their NBI data as a part of several initiatives: for the annual NBI tape submittal, for the MARs, as well as for internal data quality reports they have developed.

-PennDOT is currently conducting a large scale IT project to improve data integrity in BMS2. This includes many quality initiatives, but probably the most important is that hundreds of data validation errors, warnings, and some fatal errors have been coded into BMS2. This includes all of the NBI error checks and validations.

-PennDOT also maintains an open-end consultant agreement to provide independent inspections and reviews. These consultants are utilized to, among other things, perform blind inspections of a sample of bridges, to provide the PennDOT with a comparison to the NBI inspection reports for evaluation of consultant inspection firms.

U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Final Summary of Metric

State Pennsylvania

Review Year PY19

-PennDOT has dedicated staff and resources specifically to the tasks associated with QA/QC of inspections, and continues to refine policies and procedures in response to issues and findings from the FHWA NBIP reviews.

-Issues and critical findings discovered in the QA/QC process are used to update the bridge inspection refresher training that is required for all inspectors by PennDOT policy every two years. Any newly developed policies, procedures, and techniques can be added to the refresher training.

-FHWA HQ recognizes PennDOT as being a national leader in QA/QC program policies and procedures. They are recognized as having commendable state practices, and that "in general, QC/QA procedures are comprehensive and an excellent example." https://www.fhwa.dot.gov/bridge/nbis/nbisframework.cfm

Findings

None

Conclusions

Pennsylvania is compliant with Metric 20 because QC/QA procedures have been established and implemented. These procedures include periodic field reviews of inspection teams, periodic refresher training requirements, and independent review of inspection reports, computations, and NBI data.
Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

None

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance C

Mar 31 Resolution Complete ☑

U.S. Department of Transportation
Federal Highway Administration

National Bridge Inspection Program

Final Summary of Metric

State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Int
Metric Name	21 - Inspection Procedures - Critical Findings			Prior Year Compliance	SC

Metric Summary - Complete by December 31st

Extent of Review

For the Intermediate-level assessment of Metric 21, the Division performed the following review activities:

- Monitored and reviewed all notifications to confirm that critical findings are being addressed.
- Verified the status of any critical findings during field reviews of bridges for Metrics 12 and 22.
- Assessed based on previous review results and the reviewer's knowledge and awareness of the State's process for addressing critical findings.
- Verified that the established critical finding procedure meets the requirements of the NBIS.
- Randomly sampled bridges and reviewed the bridge files to ensure that actions taken and documentation were in accordance with the established procedure, and that proper notifications of critical findings were provided.
- Included some bridges from this metric's random sample in the Metric 12 and 22 field review sample, to verify that findings were addressed according to procedures. (Note- field review sampling is done automated utilizing HQ-provided NBIP sampling tool).
-

Observations

REVIEW OF PENNDOT POLICY

PennDOT policy has undergone revisions subsequent to PY2018 review and PY2018 PCA. The definition of a critical finding is consistent with the NBIS: any structural or safety issue that requires immediate follow-up action. In terms of existing PennDOT policy, this would consistent of 3 things: anything that would be a Priority 0 maintenance item (critical) for a structural component; an issue that would lead to closure of the bridge, reported on Bridge Problem Reports; or, any bridge with a structural component (deck, super, sub or scour) condition rating of 2 or less. These 3 categories are described in more detail below.

Please note that all policy was uploaded under Metric 21 in PY2018 and was not re-uploaded under PY2019. Please refer to PY2018 Metric 21 whenever a policy manual or Strike-Off Letter is referenced as uploaded.

<u>Definition of Priority 0 Maintenance Item:</u>

PennDOT Publication 100A (BMS2 Coding Manual) and PennDOT Publication 238 (Bridge Inspection) together lay out the definitions and policies associated with Priority Maintenance Items. Maintenance items are coded and prioritized by the inspector on each inspection, and are broken into categories of Priority 0 (critical) through Priority 5 (routine maintenance).

Per Publication 100A, a Priority 0 indicates a Critical maintenance item, where immediate response is required.

Typical timeframe for action is no more than 7 days, but sufficient immediate action should take place to ensure safety of the traveling public.

The definition as it currently stands is:

> If not addressed immediately, such deficiencies could directly or indirectly cause partial or total structure collapse resulting from component instability and/or localized element failure; or result in loss of vehicle operator control; or failure to contain errant vehicles on the bridge deck. Emergency Flexaction work (e.g. repair, replacement, posting/closing) is necessary to immediately mitigate the structural safety deficiencies with the required timeframe.

Publication 100A then provides specific examples of Priority 0 maintenance items, broken down into the following bridge categories: Bridge Signing, Deck, Superstructure, Substructure, and Waterway. This excerpt from Publication 100A is attached.

Addressing Priority 0 Maintenance Items:

Per Publication 238 IP 2-14, updated through Strike Off Letter (PennDOT policy memorandum), Priority 0 maintenance items also require the development of a Plan of Action (POA) for addressing the critical deficiencies, to be reviewed and approved by the District Bridge Engineer. The following guidance applies to the development of the POA, defining the timeframes and emphasizing the potential need for immediate action/closure:

- Priority 0 activities are to be resolved or mitigated within 7 days of identification.
- For Priority 0 items, physical action must be taken to resolve the critical deficiency. By definition, this work cannot be deferred. By definition, monitoring alone for Priority 0 items will not suffice.
- The immediate actions taken may not resolve the deficiency, but must restore or mitigate the safety problem to an acceptable level, even if level of service must be reduced. Such an example may be to close the bridge immediately until repairs can commence.
- Additional work at a later time may be needed to restore bridge to full service and safety. This additional work may be needed at a Priority 1 level.
- Development and acceptance of Priority 0 POA should be complete within 2 days and not more than 3 days, with the timeframe beginning on the day when the deficiency is discovered.

Priority 0 Maintenance Item Responsibilities:

Responsibilities at all levels are outlined in Publication 238 IP 2.14.2, with some of these responsibilities highlighted here. The responsibilities for review and development of POAs falls with the District Bridge Engineer and staff. District Bridge Engineer is also responsible for design of repair, status reports to PennDOT Central Office, and ultimately inspecting and accepting the repair when completed. District Maintenance personnel may be responsible for completing and tracking work, or the District may be responsible for contracting the work. PennDOT Central Office provides technical assistance and provides status reports. The pertinent sections of Publication 238 and associated memoranda updates are also attached in SMART, under the PY2018 Metric 21.

For local owners, a POA is also required. The POA is developed in coordination with the District, and should occur along similar timeframes. The onus is on the inspector to inform the District and Owner, to begin the process.

Priority 0 Maintenance Item Documentation and Tracking:

The priority 0 recommendation is documented in BMS2 on the Maintenance Item screen. The POA is also documented here with approvals. Documentation of the actions taken to address Priority 0 maintenance items occurs in BMS2 on the completed maintenance item screen including date work was completed and scope of repair. Typically a limited-scope inspection will also occur post repair, documented as a Problem Area inspection in BMS2. The maintenance item functionality on BMS2 serves other purposes as well; for work completed by Department forces it links to their financial transaction system (SAP) to create a work ticket to bill the work to, acquire materials, track and bill worker time, etc.

Priority 0 maintenance items are tracked by PennDOT Central Office in their internal metrics. Central Office staff (Bridge Maintenance Engineer Scott Snyder, P.E.) track the status of open Priority 0 maintenance items weekly, and follow-up with the Districts to ensure that issues are being addressed and in a timely manner.

FHWA Notification of Priority 0 Maintenance Items:

FHWA receives automated notification of any Priority 0 maintenance items from PennDOT BMS2, when the inspection is saved in iForms (inspection software). This means, generally, the Division receives automated notification within 1 day to 1 week from the finding.

The Division tracks these findings in a spreadsheet by Performance Year. Please reference the PY2019 Metric 21 attachments for all critical findings tracked for the time period of January 2018 to December 2018.

From previous reviews, the Division and PennDOT determined that the PennDOT Bridge Problem Reports (BPRs), which are prepared in accordance with PennDOT Publication 238 Appendix IP-02B and any associated updates in active Strike-off Letters, serve as FHWA notification of critical findings. The Division receives these notifications, and feel they provide a valuable service to both Division and PennDOT management. The Division is satisfied with the current level and speed of communication of these type of closure critical findings by email or by phone.

Bridges in Critical Condition:

Similar to the Priority 0 notifications, the Division receives automated notifications of bridges that receive a component condition rating of 2 or less on an inspection. Notification is generally received within 1 week, often as soon as 1 day from the inspection finding. Notification is generated after the iForms (inspection software) inspection is saved into BMS2, which, as a best practice, should be done daily so information is not lost. The Division tracks these findings in a spreadsheet by Performance Year. Please reference the PY2019 Metric 21 attachments for all critical findings tracked for the time period of January 2018 to December 2018.

Bridges in critical condition for scour are required to have at least a Priority 1 maintenance item (6 month follow-up timeframe) for underpinning repair/scour countermeasures. The District works with local owners to complete a plan of action for completion of the priority repairs. The District is also responsible to review scour or superstructure deterioration to ensure the extent of the scour/deterioration has not increased from the previous inspection. Any bridges with a 2 or less rating for scour will receive a 6-month interval inspection. No bridge with

any 2 or less component condition rating would receive inspection at an interval exceeding 12 months.

Bridge Problem Reports:

For more immediate incidents and those requiring closure of bridges, FHWA receives notification through Bridge Problem Report process. PennDOT Bridge Problem Reports (BPRs) are prepared in accordance with PennDOT Publication 238 Appendix IP-02B and any associated updates in active Strike-off Letters, serve as the third type of FHWA notification of critical findings. A BPR is essentially a short summary of an incident that has caused a short or permanent closure of a bridge, typically received within a day to week. Some BPRs deal with inspection findings, while many are follow-ups from damage incidents (over height vehicle collisions, fires, etc).

FILE REVIEW:

Intermediate Level Sample:

The Intermediate level random sample was developed using the HQ-provided NBIP sampling tool. No critical findings remained open at the time of last assessment, which, for purposes of this review was considered to begin after December 2017. With the scrutiny and review of critical findings conducted in PY2018, the Division wanted to sample critical findings made subsequent to the new policy (taken as January 2018). Additionally, as discussed above, all critical findings in PY2019 received some level of review to determine if the new policy was effected, as tracked in the attached Critical Finding Tracking spreadsheet.

Scope of File Review:

Each bridge file was reviewed to determine if the critical finding was addressed (actions were taken to protect the public safety including closure, repair or replacement) in a timely manner (within the timeframes established in PennDOT policy), that the critical finding and any actions taken have adequate documentation in the bridge file, and that notification of the critical finding was provided to FHWA.

File Review Results:

File review results are summarized in the attached summary spreadsheet. Overall,

Field Review Result:

The field review sample included 6 bridges from the Metric 21 population, including 1 bridge from the Metric 21 intermediate-level file review sample. 1 of these bridges (BRKEY7582) had been closed then had major rehabilitation work done on the super and substructure, such that the bridge is now in overall fair condition. 1 local bridge (BRKEY7558) had a critical finding that had been documented as addressed, for the repair of several partially cracked welds where the crack was in the weld material. From documentation it was not clear what method for repair had been used (work completed by local owner maintenance crews), but it was documented as

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occurring within the correct timeframe (3 days after inspection finding). 1 state bridge (BRKEY10089) had a critical finding for loose/spalled haunch concrete on the underside that was determined to have the potential to fall onto underpassing traffic. The process for development of a POA to address (remove concrete at haunches, specified which beam lines and which bays) was followed, and the work was documented when completed. Work was completed within 4 days of the inspection finding.

Two local bridges from the field review sample (BRKEY 27944 and 27955, which were also on the Review of Locally Owned Bridges list) were closed subsequent to FHWA review due to excessive scour and undermining of masonry abutments. One other local bridge (BRKEY had a potential critical finding with regards to a section of deck that had a hole through it. Steel plates had been placed over the area, spanning from beyond the first adjacent beam on either side of the hole. The plates had shifted from the previous inspection and needed to be reset.

MONITORING OF CRITICAL FINDING REPORTS:

All critical findings for PY2019, through 1/25/2019, are attached with FHWA review comments, in the documents library associated with PY2019 Metric 21. 174 critical findings were tracked in the period from 3/31/2018 to 1/25/2019.

Findings

None.

Conclusions

Pennsylvania is compliant with Metric 21, because a documented procedure has been established and implemented to assure critical findings are addressed in a timely manner; all critical findings reviewed were addressed and documented in accordance with the procedure; and the period for notifying the FHWA of critical findings is established and followed.

Recommendations

None.

Dec 31 Compliance C

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

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State: Pennsylvania

Review Year: PY19

Final Resolution

There have been no changes since the preliminary determination.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

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State	Pennsylvania	Review Year	PY19

State	Pennsylvania	Review Year	PY19	Assessment Level	Int
Metric Name	22 - Inventory - Prepare and Maintain			Prior Year Compliance	C

Metric Summary - Complete by December 31st

Extent of Review

1) In accordance with the planned NBIP Metrics Assessment Schedule, a continuation intermediate level assessment was performed for PY19

2) FHWA performed field reviews for a LOC of 80%, MOE of 15% sample of bridges 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. 19 bridges were selected from a field population of 3586 bridges identified in the NBI sampling tool v19.1. clustered around district 8, 9 and 10

3) FHWA worked with the State to resolve all error checks, validation checks, and persistent error reports generated during the NBI submittal process.

4) Noted NBI data errors found during review of other metrics when resolving MARs and other data, for knowledge and awareness.

5) Verified NBI 14 Min-AL SI&A items with information in the bridge file and actual field conditions for an additional 10 Int-Al group of SI&A items selected during generation of the Field Review Forms provided by Headquarters.

Observations

NBI SUBMITTAL CHECKS:

-The Division reviewed the HQ data checks with PennDOT. All bridges identified on the persistent errors were identified as exceptions rather than true errors. These persistent errors are largely from a long standing PennDOT practice of coding bridges with culvert extensions as a bridge (Item 43b=/=19), but reporting an Item 62 culvert rating along with Item 58, 59, and 60. The other common exceptions pertained to a null deck width for filled masonry arches and bridges under fill, and again has been PennDOT practice for some time. A list of exceptions for the persistent errors has been developed and is uploaded and attached in the documents library for future use.

-No safety check issues were identified on the submittal checks.
Issues were identified by a new check performed by FHWA regarding a trend analysis of changes in Functionally Obsolete and Structurally Deficient deck areas. Data was given initial acceptance in May 2018, but PennDOT continued to try to see what issue had led to large increases in FO deck area as well as 50+ bridges added to the NBI in 2018 that were calculating as FO.

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Ultimately, several issues were identified. One, the additional submission of border bridges picked up several very large, old, FO bridges between NJ and PA as well as NY and PA. Second, an issue was identified on the PennDOT end that caused some of the vertical and lateral underclearance data to have the decimal point transposed (ie 300 may have been uploaded as 030). The same issue was identified with some inventory ratings. Finally, for some new bridges, there were no load rating data uploaded.
PennDOT revised and resubmitted their NBI data in October, getting final acceptance of their data October 17. PennDOT believes they have corrected this issue for the 2019 submittal. We have re-worked their internal process to include submission ahead of March 15th to Division, so Division can run the UPACS error check. Division has a spreadsheet set to do some FO and SD checks similar to HQ, with the hope that we can catch some of these type of issues in the future ahead of actual submittal.
All errors identified through this process were corrected on resubmittal.
FIELD REVIEWS:

-The following additional 10 SI&A items were selected: 2, 3, 21, 22, 27, 31, 42A, 42B, 107, and 108A. This was based on Division knowledge and awareness of items that had a higher likelihood of miscoding or are important items. Additionally 108A (wearing surface) is significant for load rating purposes.

-Overall, out of the 494 data items reviewed for the full 19 bridge sample, the Division found during field review that the SI&A coding for 17 items (3.44% of items reviewed) was out of the acceptable tolerance. These errors were corrected for the 2019 submittal.

-The most common error in coding was Item 113 (Scour Critical Bridges) with three occurrences, followed by Item 31 (Design Load), 35 (Structure Flared), and 47 (Inv. Route Horizontal Clearance) with two occurrences each.

Findings

None

Conclusions

Pennsylvania is compliant with Metric 22 because 96.56% of the inventory items reviewed are within the acceptable tolerances, all identified items not within the acceptable tolerances were corrected, and FHWA data checks did not find any true errors.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Recommendations

None

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State: Pennsylvania

Review Year: PY19

Dec 31 Compliance: C

Dec 31 Summary Complete: ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

There have been no changes since preliminary determination.

Mar 31 Compliance: C

Mar 31 Resolution Complete: ☑

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State: Pennsylvania | Review Year: PY19

State: Pennsylvania | Review Year: PY19 | Assessment Level: Min

Metric Name: 23 - Inventory - Timely Updating of Data | Prior Year Compliance: SC

Metric Summary - Complete by December 31st

Extent of Review

For the review of Metric 23, the Division performed the following tasks:
(1) Verified the state submittal of SI&A data to the NBI, and verified that any issues identified were resolved in the specified timeframe.
(2) Assessed based on prior review results and the Division bridge staff's knowledge and awareness of the State's program.
(3) Assessed how the State is able to determine if bridge SI&A data is updated in the specified timeframe.

Observations

SUBMITTAL OF 2018 NBI DATA:
PennDOT made the 2018 submission by March 15 as verified by NBI administrator (see attached correspondence in documents library under PY2019 Metric 23. Issues were identified by a new check performed by FHWA regarding a trend analysis of changes in Functionally Obsolete and Structurally Deficient deck areas. Data was given initial acceptance in May 2018, but PennDOT continued to try to see what issue had led to large increases in FO deck area as well as 50+ bridges added to the NBI in 2018 that were calculating as FO.
Ultimately, several issues were identified. One, the additional submission of border bridges picked up several very large, old, FO bridges between NJ and PA as well as NY and PA. Second, an issue was identified on the PennDOT end that caused some of the vertical and lateral underclearance data to have the decimal point transposed (ie 300 may have been uploaded as 030). The same issue was identified with some inventory ratings. Finally, for some new bridges, there were no load rating data uploaded.
PennDOT revised and resubmitted their NBI data in October, getting final acceptance of their data October 17.
PennDOT believes they have corrected this issue for the 2019 submittal. We have re-worked their internal process to include submission ahead of March 15th to Division, so Division can run the UPACS error check. Division has a spreadsheet set to do some FO and SD checks similar to HQ, with the hope that we can catch some of these type of issues in the future ahead of actual submittal.
VERIFICATION OF UPDATE OF SI&A DATA:
PennDOT records Item 90 (inspection date) using MM/DD/YY format in BMS2, and by policy this is supposed to be the date the inspection began and was created in their iForms inspection form program. PennDOT BMS2 also records when the inspection is accepted by the reviewer, which uploads most of the SI&A data into the database. For most inspections, they can then use these two dates to determine if the data was updated in the 90/180 day format. If the inspection lasts longer than 1 day, then there is technically less than 90/180 days to update the data. This may be a bigger issue on large, complex inspections that take longer than a day to perform, or cases where an inspector may begin and complete a majority of the inspection but must return at a later date to complete the work (ie, inspection of spans directly over railroad where flaggers were not available).
PennDOT tracks this information on their internal metrics, as acceptance of data is also important for them to be able to do effective tracking of inspection timeliness. (For example, on the frequency metrics, padding the

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inspection date by 90 days pushes them into at best substantial compliance if an inspection were to be missed.) PennDOT indicated they achieved roughly the same level of overall compliance as in PY2018.
One improvement is to the actual NBI data. In PY2018, MARs showed approximately 50 bridges that were not updated within the 90/180 timeframe, showing them as overdue even though the inspections had occurred. PennDOT central office put out a notice for the 2018 submittal ahead of their data cut off (usually 12/31), asking all districts to review any backlog of inspections and get them accepted ahead of 12/31. This noticeably cut down on the number of overdue bridges in the MARs, although there were still 5 inspections identified that were not accepted at the time of submittal.

Findings

-PennDOT does not accept 100% of inspections within the required 90/180 day timeframe. This is indicated by PennDOT tracking data showing roughly 96% of inspections accepted within the required timeframe.

Conclusions

Pennsylvania is substantially compliant with Metric 23, because less than 100% of inspections are updated in the State inventory within the required 90/180 days.

Compliance determinations were discussed with the State Program Manager on 12/07/2018. Division leadership were briefed on 12/18/2018.

Improvement plan revisions are under development and will be attached to the 3/31 final summary.

Recommendations

Dec 31 Compliance SC

Dec 31 Summary Complete ☑

Metric Resolution and Corrective Actions - Complete by March 31st

Final Resolution

No change in compliance determination from 12/31.

Improvement plan has been developed with PennDOT and reviewed by BSE. IP is attached in documents library and an entry created on dashboard.

Mar 31 Compliance SC

Mar 31 Resolution Complete ☑