

Reliability Standard Audit Worksheet¹

TOP-010-1 –Real-time Reliability Monitoring and Analysis Capabilities

This section to be completed by the Compliance Enforcement Authority.

Audit ID: Audit ID if available; or REG-NCRnnnnn-YYYYMMDD
Registered Entity: Registered name of entity being audited
NCR Number: NCRnnnnn
Compliance Enforcement Authority: Region or NERC performing audit
Compliance Assessment Date(s)²: Month DD, YYYY, to Month DD, YYYY
Compliance Monitoring Method: [On-site Audit | Off-site Audit | Spot Check]
Names of Auditors: Supplied by CEA

Applicability of Requirements

	BA	DP	GO	GOP	IA	LSE	PA	PSE	RC	RP	RSG	TO	TOP	TP	TSP
R1													X		
R2	X														
R3													X		
R4	X														
R5													X		
R6													X		
R7	X												X		

Legend:

Text with blue background:	Fixed text – do not edit
Text entry area with Green background:	Entity-supplied information
Text entry area with white background:	Auditor-supplied information

¹ NERC developed this Reliability Standard Audit Worksheet (RSAW) language in order to facilitate NERC’s and the Regional Entities’ assessment of a registered entity’s compliance with this Reliability Standard. The NERC RSAW language is written to specific versions of each NERC Reliability Standard. Entities using this RSAW should choose the version of the RSAW applicable to the Reliability Standard being assessed. While the information included in this RSAW provides some of the methodology that NERC has elected to use to assess compliance with the requirements of the Reliability Standard, this document should not be treated as a substitute for the Reliability Standard or viewed as additional Reliability Standard requirements. In all cases, the Regional Entity should rely on the language contained in the Reliability Standard itself, and not on the language contained in this RSAW, to determine compliance with the Reliability Standard. NERC’s Reliability Standards can be found on NERC’s website. Additionally, NERC Reliability Standards are updated frequently, and this RSAW may not necessarily be updated with the same frequency. Therefore, it is imperative that entities treat this RSAW as a reference document only, and not as a substitute or replacement for the Reliability Standard. It is the responsibility of the registered entity to verify its compliance with the latest approved version of the Reliability Standards, by the applicable governmental authority, relevant to its registration status.

The NERC RSAW language contained within this document provides a non-exclusive list, for informational purposes only, of examples of the types of evidence a registered entity may produce or may be asked to produce to demonstrate compliance with the Reliability Standard. A registered entity’s adherence to the examples contained within this RSAW does not necessarily constitute compliance with the applicable Reliability Standard, and NERC and the Regional Entity using this RSAW reserves the right to request additional evidence from the registered entity that is not included in this RSAW. Additionally, this RSAW includes excerpts from FERC Orders and other regulatory references. The FERC Order cites are provided for ease of reference only, and this document does not necessarily include all applicable Order provisions. In the event of a discrepancy between FERC Orders, and the language included in this document, FERC Orders shall prevail.

² Compliance Assessment Date(s): The date(s) the actual compliance assessment (on-site audit, off-site spot check, etc.) occurs.

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Findings

(This section to be completed by the Compliance Enforcement Authority)

Req.	Finding	Summary and Documentation	Functions Monitored
R1			
R2			
R3			
R4			
R5			
R6			
R7			

Req.	Areas of Concern

Req.	Recommendations

Req.	Positive Observations

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Subject Matter Experts

Identify the Subject Matter Expert(s) responsible for this Reliability Standard.

Registered Entity Response (Required; Insert additional rows if needed):

SME Name	Title	Organization	Requirement(s)

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R1 Supporting Evidence and Documentation

- R1.** Each Transmission Operator shall implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments. The Operating Process or Operating Procedure shall include:
 - 1.1.** Criteria for evaluating potential Real-time data quality discrepancies including, but not limited to:
 - 1.1.1.** Data outside of a prescribed data range;
 - 1.1.2.** Analog data not updated within a predetermined time period;
 - 1.1.3.** Data entered manually to override telemetered information; and
 - 1.1.4.** Data that are otherwise identified as invalid or suspect.
 - 1.2.** Actions to coordinate resolution of Real-time data quality discrepancies with the entity(ies) responsible for providing the data.
- M1.** Each Transmission Operator shall have evidence that it implemented its Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments. This evidence could include, but is not limited to: 1) an Operating Procedure or Operating Process in electronic or hard copy format meeting all provisions of Requirement R1, and 2) evidence the Transmission Operator implemented the Operating Procedure or Operating Process as called for in the Operating Procedure or Operating Process, such as dated operator or supporting logs, dated checklists, voice recordings, voice transcripts, or other evidence.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested¹:

Provide the following evidence, or other evidence to demonstrate compliance.
Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform Real-time monitoring and Real-time Assessments
Evidence of implementation of the Operating Process or Operating Procedure which addresses the quality of the Real-time data necessary to perform Real-time monitoring and Real-time Assessments

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s)	Description of Applicability of Document
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				or Section(s)	

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to TOP-010-1, R1

This section to be completed by the Compliance Enforcement Authority

	Review and verify the entity’s Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform Real-time monitoring and Real-time Assessments exists and includes:
	(Part 1.1) Criteria for evaluating potential Real-time data quality discrepancies including, but not limited to:
	(Part 1.1.1) Data outside of a prescribed data range
	(Part 1.1.2) Analog data not updated within a predetermined time period
	(Part 1.1.3) Data entered manually to override telemetered information
	(Part 1.1.4) Data that are otherwise identified as invalid or suspect
	(Part 1.2) Actions to coordinate resolution of Real-time data quality discrepancies with the entity(ies) responsible for providing the data
	Verify implementation of the Operating Process or Operating Procedure which addresses the quality of the Real-time data necessary to perform Real-time monitoring and Real-time Assessments

Note to Auditor: From the rationale for R1, the TOP uses a set of Real-time data identified in proposed standard TOP-003-3 Requirement R1 to perform its Real-time monitoring and Real-time Assessments. Functional requirements to perform monitoring and Real-time Assessments appear in other standards.

From the rationale for R1, Requirement R1 Part 1.2 of this standard specifies the TOP shall include actions to coordinate resolution of Real-time data quality discrepancies in its Operating Process or Operating Procedure. These actions could be the same as the process to resolve data conflicts required by proposed TOP-003-3 Requirement R5 Part 5.2 provided that this process could resolve Real-time data quality issues.

From the Guidelines and Technical Basis: Real-time monitoring, or monitoring the Bulk Electric System (BES) in Real-time is a primary function of Reliability Coordinators (RCs), Transmission Operators (TOPs), and Balancing Authorities (BAs) as required by existing and proposed TOP and IRO standards. As used in TOP and IRO standards, monitoring involves observing operating status and operating value(s) in Real-time for awareness of system conditions. Real-time monitoring includes the following activities performed in Real-time:

- Acquisition of operating data;
- Display of operating data as needed for visualization of system conditions;
- Audible or visual alerting when warranted by system conditions; and
- Audible or visual alerting when monitoring and analysis capabilities degrade or become unavailable.

Auditor Notes:

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R2 Supporting Evidence and Documentation

- R2.** Each Balancing Authority shall implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments. The Operating Process or Operating Procedure shall include:
 - 2.1.** Criteria for evaluating potential Real-time data quality discrepancies including, but not limited to:
 - 2.1.1.** Data outside of a prescribed data range;
 - 2.1.2.** Analog data not updated within a predetermined time period;
 - 2.1.3.** Data entered manually to override telemetered information; and
 - 2.1.4.** Data that are otherwise identified as invalid or suspect.
 - 2.2.** Actions to coordinate resolution of Real-time data quality discrepancies with the entity(ies) responsible for providing the data.
- M2.** Each Balancing Authority shall have evidence it implemented its Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments. This evidence could include, but is not limited to: 1) an Operating Procedure or Operating Process in electronic or hard copy format meeting all provisions of Requirement R2 and evidence the Balancing Authority implemented the Operating Procedure or Operating Process as called for in the Operating Procedure or Operating Process, such as dated operator or supporting logs, dated checklists, voice recordings, voice transcripts, or other evidence.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested¹:

Provide the following evidence, or other evidence to demonstrate compliance.
Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform Real-time monitoring and Real-time Assessments
Evidence of implementation of the Operating Process or Operating Procedure which addresses the quality of the Real-time data necessary to perform Real-time monitoring and Real-time Assessments

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.					
File Name	Document Title	Revision or Version	Document Date	Relevant Page(s)	Description of Applicability of Document

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				or Section(s)	

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to TOP-010-1, R2

This section to be completed by the Compliance Enforcement Authority

	Review and verify the entity’s Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform Real-time monitoring and Real-time Assessments exists and includes:
	(Part 2.1) Criteria for evaluating potential Real-time data quality discrepancies including, but not limited to:
	(Part 2.1.1) Data outside of a prescribed data range
	(Part 2.1.2) Analog data not updated within a predetermined time period
	(Part 2.1.3) Data entered manually to override telemetered information
	(Part 2.1.4) Data otherwise identified as invalid or suspect
	(Part 2.2) Actions to coordinate resolution of Real-time data quality discrepancies with the entity(ies) responsible for providing the data
	Verify implementation of the Operating Process or Operating Procedure which addresses the quality of the Real-time data necessary to perform Real-time monitoring and Real-time Assessments

Note to Auditor: From the rationale for R2, the BA uses a set of Real-time data identified in proposed standard TOP-003-3 Requirement R2 to perform its analysis functions and Real-time monitoring. Requirements to perform monitoring appear in other standards.

From the rationale for R2, Requirement R2 Part 2.2 of this standard specifies the BA shall include actions to coordinate resolution of Real-time data quality discrepancies in its Operating Process or Operating Procedure. These actions could be the same as the process to resolve data conflicts required by proposed TOP-003-3 Requirement R5 Part 5.2 provided that this process could resolve Real-time data quality issues.

From the Guidelines and Technical Basis: Real-time monitoring, or monitoring the Bulk Electric System (BES) in Real-time is a primary function of Reliability Coordinators (RCs), Transmission Operators (TOPs), and Balancing Authorities (BAs) as required by existing and proposed TOP and IRO standards. As used in TOP and IRO standards, monitoring involves observing operating status and operating value(s) in Real-time for awareness of system conditions. Real-time monitoring includes the following activities performed in Real-time:

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- Acquisition of operating data;
- Display of operating data as needed for visualization of system conditions;
- Audible or visual alerting when warranted by system conditions; and
- Audible or visual alerting when monitoring and analysis capabilities degrade or become unavailable.

Auditor Notes:

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R3 Supporting Evidence and Documentation

- R3.** Each Transmission Operator shall provide its System Operators with indication(s) of the quality of Real-time data necessary to perform its Real-time monitoring and Real-time Assessments.
- M3.** Each Transmission Operator shall have evidence it provided its System Operators with indications of the quality of Real-time data necessary to perform its Real-time monitoring and Real-time Assessments. This evidence could include, but is not limited to, operator logs, computer printouts, system specifications, or other evidence.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested:

Provide the following evidence, or other evidence to demonstrate compliance.
The indication(s) of the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments
The method that these indication(s) are provided to the entity’s System Operators

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to TOP-010-1, R3

This section to be completed by the Compliance Enforcement Authority

	Verify the indication(s) of the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments exist.
	Verify that these indication(s) are provided to the entity’s System Operators.

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Note to Auditor:

Auditor Notes:

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R4 Supporting Evidence and Documentation

- R4.** Each Balancing Authority shall provide its System Operators with indication(s) of the quality of Real-time data necessary to perform its analysis functions and Real-time monitoring.
- M4.** Each Balancing Authority shall have evidence it provided its System Operators with indications of the quality of Real-time data necessary to perform its analysis functions and Real-time monitoring. This evidence could include, but is not limited to, operator logs, computer printouts, system specifications, or other evidence.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested:

Provide the following evidence, or other evidence to demonstrate compliance.
The indication(s) of the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments
The method that these indication(s) are provided to the entity's System Operators

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to TOP-010-1, R4

This section to be completed by the Compliance Enforcement Authority

	Verify the indication(s) of the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments exist.
	Verify that these indication(s) are provided to the entity's System Operators.

Note to Auditor:

Auditor Notes:

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R5 Supporting Evidence and Documentation

- R5.** Each Transmission Operator shall implement an Operating Process or Operating Procedure to maintain the quality of any analysis used in its Real-time Assessments. The Operating Process or Operating Procedure shall include:
 - 5.1.** Criteria for evaluating the quality of any analysis used in its Real-time Assessments; and
 - 5.2.** Actions to resolve quality deficiencies in any analysis used in its Real-time Assessments.

- M5.** Each Transmission Operator shall have evidence it implemented its Operating Process or Operating Procedure to maintain the quality of any analysis used in its Real-time Assessments. This evidence could include, but is not limited to: 1) an Operating Procedure or Operating Process in electronic or hard copy format meeting all provisions of Requirement R5, and 2) evidence that the Transmission Operator implemented the Operating Procedure or Operating Process as called for in the Operating Procedure or Operating Process, such as dated operator logs, dated checklists, voice recordings, voice transcripts, or other evidence.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested:

Provide the following evidence, or other evidence to demonstrate compliance.
Operating Process or Operating Procedure to maintain the quality of any analysis used in its Real-time Assessments
Evidence of implementation of the Operating Process or Operating Procedure which maintains the quality of any analysis used in its Real-time Assessments

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to TOP-010-1, R5

This section to be completed by the Compliance Enforcement Authority

	Verify that the Operating Process or Operating Procedure to maintain the quality of any analysis used in its Real-time Assessments includes:
	(Part 5.1) Criteria for evaluating the quality of any analysis used in its Real-time Assessments
	(Part 5.2) Actions to resolve quality deficiencies in any analysis used in its Real-time Assessments
	Verify implementation of the Operating Process or Operating Procedure which maintains the quality of any analysis used in its Real-time Assessments
Note to Auditor: Requirements to perform Real-time Assessments appear in other standards.	

Auditor Notes:

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R6 Supporting Evidence and Documentation

- R6.** Each Transmission Operator shall provide its System Operators with indication(s) of the quality of any analysis used in its Real-time Assessments.
- M6.** Each Transmission Operator shall have evidence that it provided its System Operators with indication(s) of the quality of any analysis used in its Real-time Assessment capabilities. This evidence could include, but is not limited to, operator logs, computer printouts, system specifications, or other evidence.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested:

Provide the following evidence, or other evidence to demonstrate compliance.
The indication(s) of the quality of any analysis used in its Real-time Assessments
The method that these indication(s) are provided to the entity's System Operators

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to TOP-010-1, R6

This section to be completed by the Compliance Enforcement Authority

	Verify the indication(s) of the quality of any analysis used in its Real-time Assessments exist.
	Verify that these indication(s) are provided to the entity's System Operators.

Auditor Notes:

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Audit ID: Audit ID if available; or NCRnnnnn-YYYYMMDD

RSAW Version: RSAW_TOP-010-1_2015_v1 Revision Date: September, 2015 RSAW Template: RSAW2014R1.2

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R7 Supporting Evidence and Documentation

- R7.** Each Transmission Operator and Balancing Authority shall utilize an independent alarm process monitor that provides notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor has occurred.
- M7.** Each Transmission Operator and Balancing Authority shall have evidence that it utilized an independent alarm process monitor that provided notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor occurred. This evidence could include, but is not limited to, operator logs, computer printouts, system specifications, or other evidence.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested:

Provide the following evidence, or other evidence to demonstrate compliance.
The independent alarm process monitor used by the entity
The notification(s) when a failure of its Real-time monitoring alarm processor has occurred
The method that these notification(s) are provided to the entity's System Operators

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to TOP-010-1, R7

This section to be completed by the Compliance Enforcement Authority

	Verify the entity has an independent alarm process monitor
	Verify the notification(s) when a failure of its Real-time monitoring alarm processor has occurred exist.
	Verify that these notification(s) are provided to the entity's System Operators.

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Note to Auditor: From the rationale for R7, the requirement addresses recommendation S7 of the Real-time Best Practices Task Force report concerning operator awareness of alarm availability.

An independent alarm process monitor is one that would not fail with a simultaneous failure of the alarm processor. A 'heartbeat' or 'watchdog' monitoring system may accomplish this objective.

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Additional Information:

Reliability Standard

Insert embedded Standard file here and Implementation Plan (if required)

The RSAW developer should provide the following information without hyperlinks. Update the information below as appropriate.

In addition to the Reliability Standard, there is an applicable Implementation Plan available on the NERC Web Site. (Remove this statement if embedded file included)

In addition to the Reliability Standard, there is background information available on the NERC Web Site.

Capitalized terms in the Reliability Standard refer to terms in the NERC Glossary, which may be found on the NERC Web Site.

Sampling Methodology [If developer deems reference applicable]

Sampling is essential for auditing compliance with NERC Reliability Standards since it is not always possible or practical to test 100% of either the equipment, documentation, or both, associated with the full suite of enforceable standards. The Sampling Methodology Guidelines and Criteria (see NERC website), or sample guidelines, provided by the Electric Reliability Organization help to establish a minimum sample set for monitoring and enforcement uses in audits of NERC Reliability Standards.

Regulatory Language [Developer to ensure RSAW has been provided to NERC Legal for links to appropriate Regulatory Language – See example below]

E.g. FERC Order No. 742 paragraph 34: “Based on NERC’s.....”

E.g. FERC Order No. 742 Paragraph 55, Commission Determination: “We affirm NERC’s.....”

Selected Glossary Terms [If developer deems applicable]

The following Glossary terms are provided for convenience only. Please refer to the NERC web site for the current enforceable terms.

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Revision History for RSAW

Version	Date	Reviewers	Revision Description
1	09/14/2015	RSAW Task Force, Standards Drafting Team, NERC Compliance Assurance	New Document

ⁱ Items in the Evidence Requested section are suggested evidence that may, but will not necessarily, demonstrate compliance. These items are not mandatory and other forms and types of evidence may be submitted at the entity's discretion.

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