Comparison of NYSRC Rule D.2 to NERC Standards and NPCC Criteria

This table is intended to show that for NYSRC Rule D.2, there are either NERC or NPCC reliability requirements that are at least as specific or stringent in meeting the reliability intent of Rule D.2. First, the NYSRC Rule, which introduces the reliability intent to be met by the subsequent Requirements, is compared to the corresponding NERC Standard Purpose statement, and the NPCC Criteria Objective. (The purpose statement of NERC Standards and the Objective statement of NPCC Criteria are similar to the NYSRC Rule section in that they each present the intent of the Rule/Standard/Criteria, without specifying explicit requirements). Following that, each NYSRC Rule D.2 Requirement is compared to applicable NERC and/or NPCC Requirements. Since NYSRC completed its reformatting of the Reliability Rules, the format of a Reliability Rule, a NERC Standard, and an NPCC Directory are similar. This similarity is helpful in conducting this comparison. Note that Rule D.2 R1 consists of three components, and they are addressed in three separate sections of the table.

The purpose statement of NERC Standards and the Objective statement of NPCC Criteria are similar to the NYSRC Rule section in that they each present the intent of the Rule/Standard/Criteria, without specifying explicit requirements.

Do the NYSRC Rule and applicable NERC and NPCC reliability requirements address the same reliability concern?	NYSRC Rule D.2	NERC EOP-011-1 and NPCC Directory 2	Conclusion
	Following a Major Emergency the NYISO shall have the capability to shed load rather than risk an uncontrolled system failure.	NERC Standard EOP-011-1 Purpose To address the effects of operating Emergencies by ensuring each Transmission Operator and Balancing Authority has developed Operating Plan(s) to mitigate operating Emergencies, and that those plans are coordinated within a Reliability Coordinator Area. NERC Standard PRC-006-2 Purpose To establish design and documentation requirements for automatic underfrequency load shedding (UFLS) programs to arrest declining frequency, assist recovery of frequency following underfrequency events and provide last resort system preservation measures. NPCC Directory 2 Objective The purpose of this Directory is to present the basic factors to be considered in formulating plans and procedures to be followed in an emergency or during conditions which could lead to an emergency, in order	It is clear the NYSRC Rule, NERC EOP-011-1, PRC-006-2 purpose statements, and the NPCC Directory 2 and Directory 12 objectives address the same reliability concern.

		to facilitate mutual assistance and coordination within NPCC and adjacent areas. The objectives in formulating plans related to emergency operating conditions are: 1. To avoid the interruption of service to firm load to the extent possible. 2. To minimize the occurrence of system disturbances. 3. To contain any system disturbance and limit its effects to the area initially affected. 4. To minimize the effects of any system disturbances on customers. 5. To avoid damages to system elements. 6. To avoid hazard to the public. <u>NPCC Directory 12 Objective</u> This Directory presents the basic criteria for the design and implementation of under frequency load shedding programs to ensure that declining frequency is arrested and recovered in accordance with established NPCC performance requirements to prevent system collapse due to load-generation imbalance.	
NYSRC Rule D.2 R1 has three components, this addresses the first paragraph.			
Do NERC and/or NPCC address the need to have load shedding allocation procedures?	**NYSRC Rule D.2 R1** (1st paragraph) In the event that the frequency decline is so rapid as to prevent operator action, automatic facilities	**NERC EOP-011-1 Requirement** R1. Each Transmission Operator shall develop, maintain, and implement one or more Reliability Coordinator-reviewed Operating Plan(s) to mitigate operating Emergencies in its Transmission Operator Area. The Operating Plan(s) shall include the following, as applicable:	**Conclusion** This paragraph specifies 2 requirements: 1. Follow NPCC UFLS Guidelines, and 2. Develop procedures to that effect.

	shall achieve *load shedding* without regard for transmission loadings. *Load shedding* allocation procedures shall be developed which meet the requirements of the NPCC Underfrequency Load Shedding Guides.	1.2.5. Provisions for operator-controlled manual Load shedding that minimizes the overlap with automatic Load shedding and are capable of being implemented in a timeframe adequate for mitigating the Emergency; **NERC PRC-006-2 Requirement** R3. Each Planning Coordinator shall develop a UFLS program, including notification of and a schedule for *implementation b*y UFLS entities within its area, that meets the following performance characteristics in simulations of underfrequency conditions resulting from an imbalance scenario, where an imbalance = [(load — actual generation output) / (load)], of up to 25 percent within the identified island(s).	The NYISO is obligated to follow NPCC as part of its membership. NPCC Directory 12 Criteria address UFLS programs. NERC Requirements (EOP-011-1 R1 for example) obligate NYISO and other TOPs to include in their Operating Plans, among other mitigating actions, manual Load shedding that will not interfere with UFLS. NERC Requirement EOP-006-2 R3 requires the PC to have a program. The NYISO program includes allocation of UFLS by TO. Therefore, this section of D.2 R1 is obviated by NPCC and NERC programs and requirements.
NYSRC Rule D.2 R1 has three components, this addresses the second paragraph.			
Do NERC and/or NPCC address the need to shed at least 50% of load within 10 minutes? Is there a requirement that the first half of the load shed manually not include any UFLS load?	**NYSRC Rule D.2 R1** (2nd paragraph) The *NYCA* must be capable of shedding at least 50 percent of its *load* in ten (10) minutes or less. Insofar as practical, the first half of the	**NERC EOP-011-1 Requirement** R1. Each Transmission Operator shall develop, maintain, and implement one or more Reliability Coordinator-reviewed Operating Plan(s) to mitigate operating Emergencies in its Transmission Operator Area. The Operating Plan(s) shall include the following, as applicable: 1.2.5. Provisions for operator-controlled manual Load shedding that minimizes the overlap with automatic Load shedding and are capable of being	**Conclusion** NERC Requirements R1.2.5 obligates NYISO and other TOPs to implement manual Load shedding that will not interfere with UFLS. NPCC Dir 2 Criteria 5.2 obligates the NYISO to shed at least 50% of load in 10 minutes or less. NPCC Dir 2 Appendix B section 4.3

	load shed manually should not include that *load* which is part of any automatic *load shedding* plan.	implemented in a timeframe adequate for mitigating the Emergency; **NPCC Directory 2 Criteria** 5.2 Manual Load Shedding Requirement Each Balancing Authority shall have the capability of manually shedding at least fifty percent of its area load in ten minutes or less. Manual load shedding plans shall not interrupt bulk power system elements. 5.2.1 Manual load shedding procedures shall be reviewed at least annually by the Balancing Authority and Transmission Operator, to ensure that the proper amount of load can be shed within the time limits prescribed. And Appendix B 4.3 Actions of a Balancing Authority to control Frequency and operate under a Capacity/Energy Emergency 4.3.2 Manual Load Shedding for Capacity Shortage and Frequency Control Each Balancing Authority should normally carry out the following unless an alternative plan is submitted for review by the NPCC Task Forces on Coordination of Operation and System Studies and approved by the NPCC Reliability Coordinating Committee: 4.3.2.1 The first half of the load shed manually should not include load which is part of any automatic load shedding plan unless following manual load shedding, the requirements of Section 5.2 of NPCC Directory#12 *Automatic UFLS Program Require*ments can still be met.	specifies that the first half of the load shed should not include UFLS. Therefore, the highlighted section of D.2 R1 is obviated by NPCC and NERC programs and requirements.

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NYSRC Rule D.2 R1 has three components, this addresses the third paragraph.			
Do NERC and/or NPCC address frequency declining below 58.5%?	**NYSRC Rule D.2 R1** (3rd paragraph) If frequency is still declining below 58.5 Hz, all transmission systems shall take such steps as are necessary, including separating units to preserve generation, minimize damage and service interruption.	**NERC EOP-011-1 Requirement** **R1.** Each Transmission Operator shall develop, maintain, and implement one or more Reliability Coordinator-reviewed Operating Plan(s) to mitigate operating Emergencies in its Transmission Operator Area. The Operating Plan(s) shall include the following, as applicable: **1.2.5.** Provisions for operator-controlled manual Load shedding that minimizes the overlap with automatic Load shedding and are capable of being implemented in a timeframe adequate for mitigating the Emergency; **NPCC Directory 2 Criteria** **Appendix B**	**Conclusion** NPCC Appendix B stipulates actions to be taken. NERC Requirements (EOP-011-1 R1 for example) obligate NYISO and other TOPs to include in their Operating Plans, among other mitigating actions, manual Load shedding that will not interfere with UFLS. A key stipulation in R1.2.5 is that the actions must be capable of being implemented in a time frame adequate for mitigating the emergency. Comment: The highlighted paragraph of D.2 R1 is a guideline, not a requirement per se. NERC EOP-011-1 R1 specifies those guidelines must be included in the TOPs Operating Plan. NYISO EOM section 3.3.1 expands on these guidelines. NPCC Directory 2 Criteria 5.2.1 obligates the NYISO to review Manual load shedding procedures to ensure they are effective. NPCC Directory 2, Appendix B specifies certain actions to take in the event of an emergency. NYISO load shedding procedures anticipate the possibility of needing to

			preserve generation. NERC EOP-011-1 requires the NYISO and other TOPs to include in their Operating Plans various mitigating actions in the event of an emergency. The NYISO EOM section 3.3 contains several additional options. Further, the 58.5 Hz threshold is apparently a legacy limit of undetermined origin, and is close to the lower thresholds of current UFLS programs. If the frequency were to drop to this level, many measures would be implemented to preserve generation, and it might or might not involve further load shedding. Therefore, the highlighted section of D.2 R1 is obviated by NPCC and NERC requirements.
NYSRC Rule D.2 R2			
Do NERC and/or NPCC require the NYISO to maintain procedures for manual and automatic load shedding?	The *NYISO* shall maintain procedures and systems that ensure that sufficient *load shedding* capability exists for both manual and automatic response.	**NERC EOP-011-1 Requirement** R1. Each Transmission Operator shall develop, maintain, and implement one or more Reliability Coordinator-reviewed Operating Plan(s) to mitigate operating Emergencies in its Transmission Operator Area. The Operating Plan(s) shall include the following, as applicable: 1.2.5. Provisions for operator-controlled manual Load shedding that minimizes the overlap with	**Conclusion** NERC EOP-011-1 and NPCC Directory 2 both require that the NYISO has manual load shed procedures. NERC EOP-006-2 and NPCC Directory 12 both require that the NYISO has UFLS procedures.

	The *NYISO* must notify the *NYSRC* of any changes to these procedures and systems.	automatic Load shedding and are capable of being implemented in a timeframe adequate for mitigating the Emergency; **NERC PRC-006-2 Requirement** R3. Each Planning Coordinator shall develop a UFLS program, including notification of and a schedule for *implementation b*y UFLS entities within its area, that meets the following performance characteristics in simulations of underfrequency conditions resulting from an imbalance scenario, where an imbalance = [(load — actual generation output) / (load)], of up to 25 percent within the identified island(s). **NPCC Directory 2 Criteria** 5.2.1 Manual load shedding procedures shall be reviewed at least annually by the Balancing Authority and Transmission Operator, to ensure that the proper amount of load can be shed within the time limits prescribed. **NPCC Directory 12 Criteria** 5.1 Under frequency Load Shedding Program – General Criteria The intent of the NPCC automatic Under frequency Load Shedding program is to ensure that declining frequency is arrested and recovered in accordance with established NPCC performance requirements stipulated in this document, as follows: 5.1.1 Frequency decline is arrested at no less than 58.0 Hz for the portions of NPCC in the Eastern Interconnection and 56.0 Hz for the portion of NPCC in the Québec Interconnection.	

		5.1.2 Frequency does not remain below 58.5 Hz for greater than 10 seconds, and does not remain below 59.5 Hz for greater than 30 seconds, for a generation deficiency of up to 25% of the load.	
NYSRC Rule D.2 R3			
Do NERC and/or NPCC require the TOs to report the amount of load that is expected to be shed for manual and automatic load shedding?	Each *Transmission Owner* shall report to the *NYISO* the amount of *load* that is expected to be shed through automatic and manual *load shedding*, coincident with the *peak load* of its *transmission district* in accordance with *NYISO* procedures. The *NYISO* shall annually report compliance of this requirement to the *NYSRC*.	**NERC EOP-011-1 Requirement** R3. The Reliability Coordinator shall review the Operating Plan(s) to mitigate operating Emergencies submitted by a Transmission Operator or a Balancing Authority regarding any reliability risks that are identified between Operating Plans. **NERC PRC-006-2 Requirement** R3. Each Planning Coordinator shall develop a UFLS program, including notification of and a schedule for implementation by UFLS entities within its area, that meets the following performance characteristics in simulations of underfrequency conditions resulting from an imbalance scenario, where an imbalance = [(load — actual generation output) / (load)], of up to 25 percent within the identified island(s). R6. Each Planning Coordinator shall maintain a UFLS database containing data necessary to model its UFLS program for use in event analyses and assessments of the UFLS program at least once each calendar year, with no more than 15 months between maintenance activities. R8. Each UFLS entity shall provide data to its Planning Coordinator(s) according to the format	**Conclusion** NPCC Directory 2, section 5.2.1 obligates the NYISO to review TOP manual load shedding procedures. NERC EOP-011 requires the NYISO to review TOP Operating Plans which must contain manual load shed. NERC PRC-006-2 R3 requires the NYISO to maintain a database (implies review) an automatic UFLS database. R8 obligates UFLS entities (e.g., TOs) to comply with the PC's plan. Therefore, D.2 R3 is obviated by NPCC and NERC requirements.

		and schedule specified by the Planning Coordinator(s) to support maintenance of each Planning Coordinator's UFLS database. **NPCC Directory 2 Criteria** 5.2.1 Manual load shedding procedures shall be reviewed at least annually by the Balancing Authority and Transmission Operator, to ensure that the proper amount of load can be shed within the time limits prescribed.	