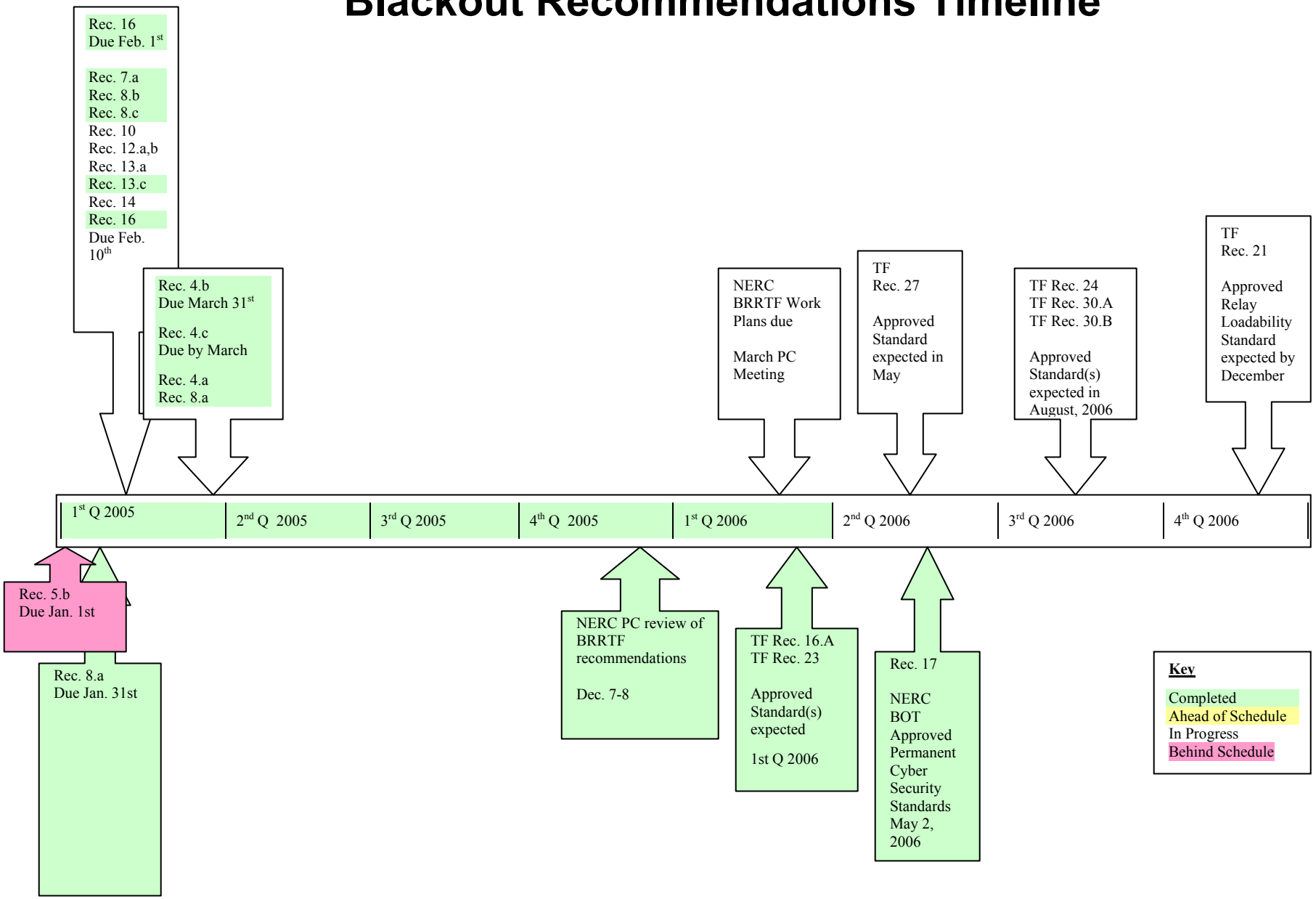
NPCC Tasks Related to NERC Blackout Recommendations Timeline



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NERC BOT #	Short Description	NERC	Other(s)						US-CA TF #	Comments
4.d	Vegetation Management Standard	X							**16.A**	**Rec. 4.d** - A new, more comprehensive standard on vegetation management has been developed and posted for industry comment through July 31, 2005. The new standard specifies minimum clearance between vegetation and energized conductors based on IEEE engineering criteria. The new standard specifies minimum clearance between vegetation and energized conductors based on IEEE engineering criteria. **TF Rec. 16.A** - The Transmission Vegetation Management Program Standard has been reposted for recirculation ballot from Jan 17-27, 2006; following a successful recirculation ballot, the standard was submitted to the NERC BOT and approved February 7, 2006.

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5.a	Recommendations Actions Tracking Program	X	NERC						**5.A**	**Rec. 5.a** - RCC approved NPCC program and procedure July 14, 2004. The April 2006 NPCC Status Report was posted on the NPCC web site. **TF Rec. 5.A** - NERC, DOE, FERC, and NRCAN continue development of a common database. Work underway to further develop NERC's existing database for tracking disturbances and unusual events. Completion scheduled for later in 2005. NERC is now looking to develop a web page for the Regions to monitor NERC requests made of them and the status of their responses.
5.b	NERC Reliability Performance Monitoring		NERC						**5.B**	**Rec. 5.b** - NERC is working with the Outage Task Force to develop a database to track and report progress in implementing all applicable blackout recommendations. Monitoring function is still under development. NERC initiated a collaborative effort with the NRC to analyze reliability performance trends.

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8.b	Evaluate UVLS	X	**TR-7** PC/TIS & SPCTF						**21.B**	**Rec. 8.b** - SS-37 drafted a status report, sent to NERC on February 10, 2005. The NPCC UVLS Evaluation Report was approved at the November 29, 2005 RCC meeting. NERC's Blackout Recommendation Review Task Force related recommendations were approved by the NERC PC in December 2005 (**TR-7**). **TF Rec. 21.B** - The NERC BOT approved a resolution to implement the Review of Regional Evaluations of UVLS Capability in Response to NERC Rec. 8b report on February 7, 2006. The resolution includes specific PC directives and deadlines.

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8.c	Evaluate Planning Standard III	X	**TR-8** PC/IDWG with SPCTF & TIS						**21.C**	**Rec. 8.c** - Analysis of the feasibility of UVLS for the NPCC Region as a part of the NPCC Overall Transmission Review was approved by the RCC approved at its November 2005 meeting. NERC's Blackout Recommendation Review Task Force related recommendations were approved by the NERC PC in December 2005 (**TR-8**). **TF Rec. 21.C** The NERC BOT approved a resolution to implement the Review of Regional Evaluations of UVLS Capability in Response to NERC Rec. 8b report on February 7, 2006. The resolution includes specific PC directives and deadlines.

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10	Establish Guidelines for Real-Time Operating Tools	X	**TR-3** Completed. **TR-5** OC/IS **TR-6** OC/SDX Task Force with MMWG							**22**	**Rec. 10** - The CO-10 WG has identified the EMS/SCADA failure review practices used by the NPCC Areas, and have put in place practices to review and analyze at each meeting any EMS/SCADA failures, including the priority and time deadlines for restoring the systems to full capability. Completed. **TF Rec. 22** - NERC's BRRTF related recommendations were approved by the NERC PC in December 2005 (**TR-3,5,6**). Work plans for these assignments will be submitted for approval at the March 2006 PC meeting. The NERC Real Time Tools Best Practices TF has received all survey responses and is analyzing the results. TFCO and CO-10 will review the findings when they are available and consider any necessary enhancements to NPCC operating tools. Incorporated into NERC's on-going best practices, standards development, and tools enhancement activities.

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12.a	Regional Criteria for Synchronized Recording Devices	X	**TR-10** PC/IDWG with SPCTF							**28.B**	**Rec. 12.a** - The SEDR WG report on Synchronized Event Data Reporting was discussed at the June 1, 2005 RCC meeting, with presentation of the associated cost/benefit given at the Sept. 2005 RCC meeting. The NERC IDWG report was approved at the May 2005 NERC BOT meeting; they resolved that the regional reliability councils take steps to improve the disturbance monitoring capabilities as outlined in the report. **TF Rec. 28.B.** NERC's Blackout Recommendation Review Task Force related recommendations were approved by the NERC PC in December 2005 (**TR-10**). Work plans for these assignments will be submitted for approval at the March 2006 PC meeting. Incorporated into NERC's on-going standards development activities. Initial standards expected to be approved in early 2006; enhanced standards on phasor measurement devices by early 2007.

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12.b	Dynamic Recorder Upgrade/Installation	X	**TR-10** PC/IDWG with SPCTF						**28.A**	**Rec. 12.b** - The SEDR WG report on Synchronized Event Data Reporting discussed at the June 1, 2005 RCC meeting. Presentation of the associated cost/benefit given at the Sept. 2005 RCC meeting. The NERC IDWG report approved at the May 2005 NERC BOT meeting; they resolved that the regional reliability councils take the outlined steps to improve disturbance monitoring capabilities. **TF Rec. 28.A -** BRRTF related recommendations were approved by the NERC PC in December 2005 (**TR-10**). Work plans for these assignments will be submitted for approval at the March 2006 PC meeting. Incorporated into NERC's on-going standards development activities. Initial standards expected to be approved in early 2006; enhanced standards on phasor measurement devices by early 2007. Cost recovery responsibility of FERC and appropriate regulatory authorities in Canada.

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13.a	Reevaluate System Operations Planning and Operating Criteria	X	NERC OC						**30.A**	**Rec. 13.a** - NERC's Blackout Recommendation Review Task Force related recommendations were approved by the NERC PC in December 2005 (**TR-6**). Work plans for these assignments will be submitted for approval at the March 2006 PC meeting. **TF Rec. 30.A** Within NPCC the CP-11 Working Group is addressing the Bulk Power System definition and which facilities are considered BPS. The RCC approved the Evaluation Study Plan for NPCC Document A-10 at their Sept. 7, 2005 meeting, and reviewed a list of existing NPCC Area BPS elements and schedule for completion of testing at its November 2005 meeting. Incorporated into NERC's on-going standard development activities. Expect approval by August 2006.

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13.c	Evaluation of Planning Processes	X	NERC PC						**24**	**Rec. 13.c** - The TIS report was approved at the March 2006 PC meeting, the NERC BOT approved the recommendations of the report on May 2, 2006. **TF Rec.24** Planning Standards MOD-013-1 and MOD-016-1 were approved by the NERC BOT on May 2, 2006. These standards become effective November 2, 2006.

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14	Model Data Validation	X	**TR-4** PC/MMWG with TIS & OC/DFWG **TR-9** PC/MMWG with TIS/SPCTF/ RIS **TR-12,13** PC/MMWG with TIS						**24**	**Rec. 14** - NERC is moving ahead with development and implementation of the "Phase III & IV" planning standards, which include model validation. Consequently, the TFSS proposes to postpone consideration of new NPCC procedures pending developments regarding related NERC standards. NERC's Blackout Recommendation Review Task Force related recommendations were approved by the NERC PC in December 2005 (T**R-4,9,12,13**). Work plans for these assignments will be submitted for approval at the March 2006 PC meeting. **TF Rec.24** Planning Standards MOD-013-1 and MOD-016-1 were approved by the NERC BOT on May 2, 2006. These standards become effective November 2, 2006.

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15	NERC to investigate future blackouts and disturbances	X							**14**	**Rec. 15 -** NERC has developed Blackout Disturbance and Response Procedures, which include requirements for the analysis of blackouts. These procedures were accepted by the board in May 2005, with the direction to obtain further input from the NERC standing committees and other stakeholders as the procedures are refined and upgraded. **TF Rec. 14** - Creation of a standing Binational ERO Oversight Group has been completed. A bilateral working group from the United States and Canada will address key issues related to electricity reliability in North America. The terms of reference were announced June 30, 2005.

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17	Evaluate NERC actions in the areas of cyber and physical security.	X							**32.A**	**Rec. 17 -** The NERC BOT adopted eight new cyber security standards that address asset identification, security management controls, personnel and training, perimeter security, systems security, incident reporting and response training, and recovery plans on May 2, 2006. These standards replace the requirements contained within Reliability Standard 1200, Urgent Action Cyber Security Standard. The new standards become effective on June 1, 2006.

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NERC BOT #	Short Description	NERC	Other(s)						US-CA TF #	Comments
	Develop Enforceable Standards for Transmission Line Ratings	X	PC/Ratings						**27**	**TF Rec. 27** - Facility Rating Methodology SAR posted, with comments due by July 15, 2005; balloting completed in Nov. 2005; FAC 008-1 (Facility Ratings Methodology) and FAC 009-1 (Establish and Communicate Facility Ratings) passed, and were adopted by the NERC BOT on February 7, 2006. One of the Determine Facility Ratings groups of standards (FAC-010-1 and FAC-011-1) were balloted as a single ballot from March 21 through March 30, 2006. Nearly one third of the ballot pool voted against the proposed standards because they believed it would weaken reliability rather than strengthen it; The drafting team will revise the standards based on the comments received and post the revised standards for public comment.

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	Establish and Implement Mapping Deliverables/Requirements for Disturbance Analysis (geographical maps and one-line diagrams).	X	OC/DAWG with IDWG							**TR-14.** NERC should specify a standard set of system maps to be maintained and supplied for analysis of system disturbances. Maps should be regularly updated to reflect changes in system topology or generation facilities. Improvements to the Reliability Coordinator Information System include system flowgate maps. Recommendation approved by the NERC PC in December 2005. Work plans for this assignments will be submitted for approval at the March 2006 PC meeting.

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	Establish EMS and SCADA Time Synchronization Standards	X	OC/Data Exchange WG with PC IDWG/SPCTF							**TR-15a.** EMS hardware and software designs should be accommodate time stamps recorded by remote telemetry units (RTUs). Each substation should have GPS synchronization capabilities. **TR-15b.** All real-time data exchanged via ICCP data (volts, flow, frequency data, ACE) between operating entities should be similarly time stamped, and those time stamps should be included in all transmittals. **TR-15c.** Data collection should be well monitored to detect equipment failures and data quality problems. **TR-15d.** Standards for data retention and archiving should be established. Recommendations approved by the NERC PC in December 2005. Work plans for these assignments will be submitted for approval at the March 2006 PC meeting.

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NERC BOT #	Short Description	NERC	Other(s)							US-CA TF #	Comments
	Evaluate and Implement "Defense in Depth" System Monitoring, Control, and Protection Measures to Slow Down and Mitigate the Severity of Cascades.	X	**16a**: PC/IDWG with TIS/SPCTF **16b**: OC/ORS with TS								**TR-16.** For each of the Interconnections, a defense-in-depth philosophy and integrated strategy should be developed based on the characteristics of that interconnection to limit the impacts of potential cascading outages. The Operating Reliability Subcommittee and Transmission Subcommittee are forming an operations planning task force to work on this. Recommendation approved by the NERC PC in December 2005. Work plans for this assignments will be submitted for approval at the March 2006 PC meeting.
	Review the Response of Switch-on-to-Fault Relay Functions to System Disturbances.	X	PC/SPCTF								**TR-17.** It is recommended that the SPCTF review the concept of “switch-onto-fault” logic and settings in relaying systems, and prepare a report for the Planning Committee on its merits, deficiencies, and setting requirements. Not started. Recommendation approved by the NERC PC in December 2005. Work plans for this assignments will be submitted for approval at the March 2006 PC meeting.

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NERC BOT #	Short Description	NERC	Other(s)							US-CA TF #	Comments
	Revise Industry Standards to Establish Under/Over Frequency Design Limits of Operation for Distance Relays.	X	PC/SPCTF								**TR-18.** Standardize a frequency floor above which relays should not trip. Such a frequency set point should be coordinated with UFLS and generator underfrequency tripping schemes. IEEE Standard C37.90 should be revised to include this limit. Not started. Recommendation approved by the NERC PC in December 2005. Work plans for this assignments will be submitted for approval at the March 2006 PC meeting.
	Evaluate and Report on the Performance and Complexity of Protection and Control Schemes for Three Terminal Lines	X	PC/SPCTF with TIS								**TR-19.** NERC should review and report on the advantages and disadvantages of the use of multi-terminal line configurations on the EHV system, and any associated complex protection and control (sequential) schemes. Particular attention should be paid to the performance of such configurations and its protection during emergency operation conditions, including expected system swings. Not started. Recommendation approved by the NERC PC in December 2005. Work plans for this assignments will be submitted for approval at the March 2006 PC meeting.

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	Establish Guidelines on High Speed Reclosing.	X	PC/SPCTF							**TR-20.** Not started. NERC should review and report on the advantages and disadvantages of autoreclosing methods on the EHV system including: • High speed automatic reclosing for multi-phase and single phase relay operation • Synchronism check reclosing Recommendations approved by the NERC PC in December 2005. Work plans for these assignments will be submitted for approval at the March 2006 PC meeting.
	Require the Installation of Underfrequency Protection for Generators and Coordination with UFLS.	X	PC/IDWG with SPCTF							**TR-21.** Underfrequency relaying should be installed on all generators, coordinated with the underfrequency load shedding relays (IDWG to lead combined scope definition of TR-8 & TR-21) Inter-regional planning study may be needed. Recommendation approved by the NERC PC in December 2005. Work plans for this assignments will be submitted for approval at the March 2006 PC meeting.

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NERC BOT #	Short Description	NERC	Other(s)						US-CA TF #	Comments
	Evaluate and Implement Coordination Requirements for Generator Backup Protection Responses in Cohesive Generation Groups.	X	PC/SPCTF with IDWG/RCWG							**TR-22.** NERC should evaluate these protection schemes and their settings for appropriateness including coordination of protection and controls when operating within a coherent generation weakly connected to an interconnection or in as an electrical island. Generators directly connected to the transmission system using a 51V should consider the use of an impedance relay instead. Not started. Recommendation approved by the NERC PC in December 2005. Work plans for this assignments will be submitted for approval at the March 2006 PC meeting.

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	Establish Regime for More In-Depth Analysis in Transmission Reliability Studies.	X	OC & PC/TIS with MMWG							**TR-23a.** NERC should re-examine the appropriateness of the 30-minute criteria for returning to a safe operation following an outage. Not started. **TR-23b.** NERC, the Regions, and the ISO/RTOs should conduct a comprehensive analysis of the bulk power system for identification of severe combinations of contingencies. Not started. **TR-23c**. NERC, the Regions, and the ISO/RTOs should develop study regimes that determine severe combinations of contingencies. Not started. Recommendations approved by the NERC PC in December 2005. Work plans for these assignments will be submitted for approval at the March 2006 PC meeting.

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	Continue "What if" Analyses, Promote Research Based on the Blackout, and Preserve Forensic Analysis Techniques.	X	PC/TIS with MMWG/IDWG /DAWG							**TR-24.** Evaluate significant "what-if" scenarios to learn how the overall system may have performed given varying system conditions or different sequence of events. Those studies should investigate the feasibility of preventative and "safety net" mitigation strategies. Not started. Recommendation approved by the NERC PC in December 2005. Work plans for this assignments will be submitted for approval at the March 2006 PC meeting.
	NBR - 1a) Review Type 1 and Type 2 Special Protection Systems (SPSs) that use indirect sensing to determine whether any improvements are warranted that could be made relatively easily and that would reduce the likelihood of their operating for conditions other than those for which they are designed.		TFSS TFSP							**NBR - 1a)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 1b) Review Type 1 and Type 2 Special Protection Systems (SPSs) that use indirect sensing to determine whether any improvements are warranted that could be made relatively easily and that would reduce the likelihood of their operating for conditions other than those for which they are designed. More specifically, the review of improvements to the "Loss of 3001" SPS should be considered and is recommended first.		TFSS TFSP								**NBR - 1b)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 2a) Protection system changes should be investigated on two specific NPCC interfaces whose performance proved to be critical during the Blackout sequence of events. Transmission owners should investigate changes that could be made to improve the security of protection operation of the Homer City 345 kV transmission lines to Watercure and Stolle Road and recommend any proposed changes to TFSS and TFSP.		TFSS TFSP TOs								**NBR - 2a)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 2b) Protection system changes should be investigated on two specific NPCC interfaces whose performance proved to be critical during the Blackout sequence of events. TFSS should investigate whether separating Ontario from Michigan for conditions similar to those experienced during the blackout would improve reliability for other conditions and would not degrade reliability, under most circumstances for both NPCC and other Regions.		TFSS								**NBR - 2b)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 3) NPCC should complete the implementation of the 300 ms time delay on UFLS relays as determined in the 2002 UFLS Assessment and approved by RCC.		TFSS TFSP								**NBR - 3)** - RCC approved the recommendation at its March 8, 2006 meeting. This project is underway, on schedule and no additional action needs to be taken.

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	NBR - 4) NPCC should continue to investigate the coordination between generating unit (generator, excitation system, and prime mover) protections and the UFLS program through its representation on the NERC System Protection and Control Task Force (SPCTF). TFSS and TFSP should conduct a review of NPCC Criteria to ensure that any required coordination between the UFLS program and generators is included.	SPCTF	TFSS TFSP								**NBR - 4)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 5a) TFSS should ensure that future assessments of the Underfrequency Load Shedding (UFLS) Program include: a) Sensitivity studies to examine the impact of unexpected load or generation loss near the electrical center of unstable swings during island formation.		TFSS								**NBR - 5a)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 5b) TFSS should ensure that future assessments of the Underfrequency Load Shedding (UFLS) Program include: b) Simulation of island formation across Area and regional boundaries and modeling more severe conditions including modeling of initiating disturbances and non-coincident tripping of circuits across the island boundary.		TFSS								**NBR - 5b)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 5c) TFSS should ensure that future assessments of the Underfrequency Load Shedding (UFLS) Program include: c) The impact of low voltages on UFLS relay performance including under-voltage supervision and accuracy of frequency measurements (as determined by TFSP).		TFSS TFSP								**NBR - 5c)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 5d) TFSS should ensure that future assessments of the Underfrequency Load Shedding (UFLS) Program include: d) Identification of large load areas within NPCC that are frequently deficient in generation by more than 25% and that are susceptible to islanding and assessment of the performance of such islands.		TFSS								**NBR - 5d)** - RCC approved the recommendation at its March 8, 2006 meeting.

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	NBR - 6a) NPCC should strive to make improvements in modeling tools and data. The TFSS should survey what methods are available now within NPCC to create accurate power flow models based on actual operating data, what initiatives are underway by NERC, how much effort it would take to develop a common approach within NPCC and any costs associated with these.		TFSS								**NBR - 6a)** - RCC approved the recommendation at its March 8, 2006 meeting.

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NERC BOT #	Short Description	NERC	Other(s)							US-CA TF #	Comments
	NBR - 6b) NPCC should strive to make improvements in modeling tools and data. NPCC should assess what methods would be most effective for modeling mid-term dynamics in analysis of disturbances that propagate over a significant time period. Specifically, TFSS should document what was learned during the blackout investigation regarding the modeling of mid-term dynamic effects. TFSS should also summarize recent industry efforts.		TFSS								**NBR - 6b)** - RCC approved the recommendation at its March 8, 2006 meeting.

NPCC 2006 May Status Report
Assignments to Address
NPCC/NERC Board/US-Canadian TF Recommendations on Blackout
P = Primary, S = Secondary, J = Joint; Green = Completed, Yellow = Ahead of Schedule, Clear = On Schedule, Pink = Behind Schedule

NERC BOT #	Short Description	NERC	Other(s)							US-CA TF #	Comments
	NBR - 6c) NPCC should strive to make improvements in modeling tools and data. Event recording devices should be time synchronized to allow expedient development of an accurate and precise Sequence of Events following system disturbances. TFSP should determine whether existing NPCC criteria is sufficient to ensure that recording devices for generating units document event times for mechanical and electrical protection and control actions.		TFSP								**NBR - 6c)** - RCC approved the recommendation at its March 8, 2006 meeting.

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NERC BOT #	Short Description	NERC	Other(s)							US-CA TF #	Comments
	NBR - 6d) NPCC should strive to make improvements in modeling tools and data. The TFSS should review past industry efforts to study dynamic load behavior, such as the NPCC COSS-2 Study, and contact others within the industry to benefit from their research. The TFSS should recommend whether to develop improved models for use in analysis of major disturbances or to develop appropriate models at the time of analyzing a disturbance.		TFSS								**NBR - 6d)** - RCC approved the recommendation at its March 8, 2006 meeting.