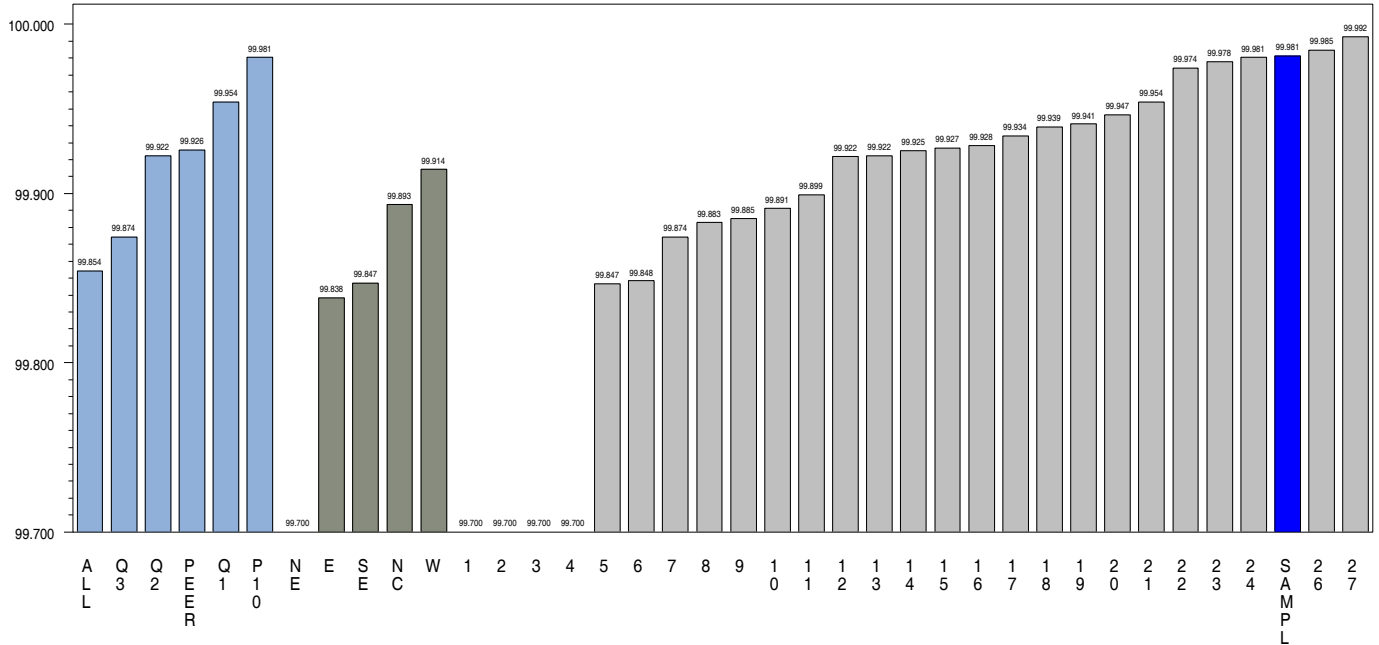


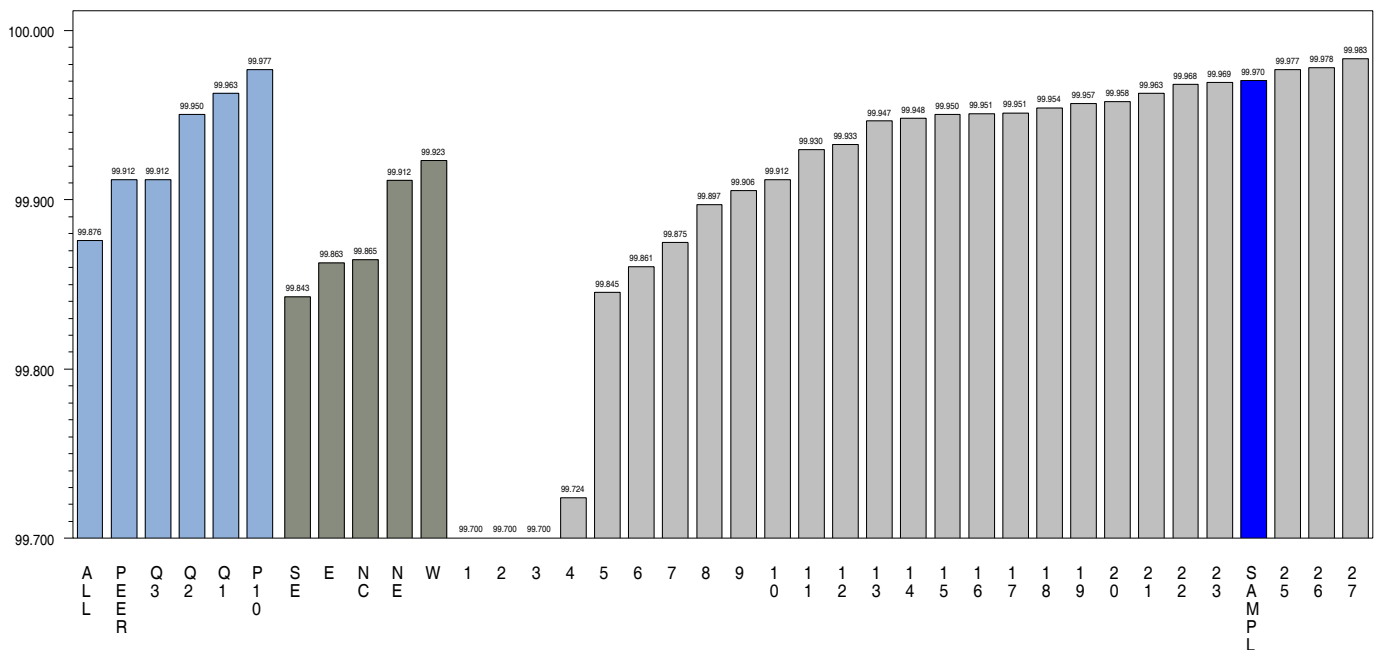
2.8.7

Availability Percentage (APC-NERC 8) 2009 SGS Transmission Reliability Benchmarking Study SAMPLE ENERGY

Year 2008, Voltage Class = XXX



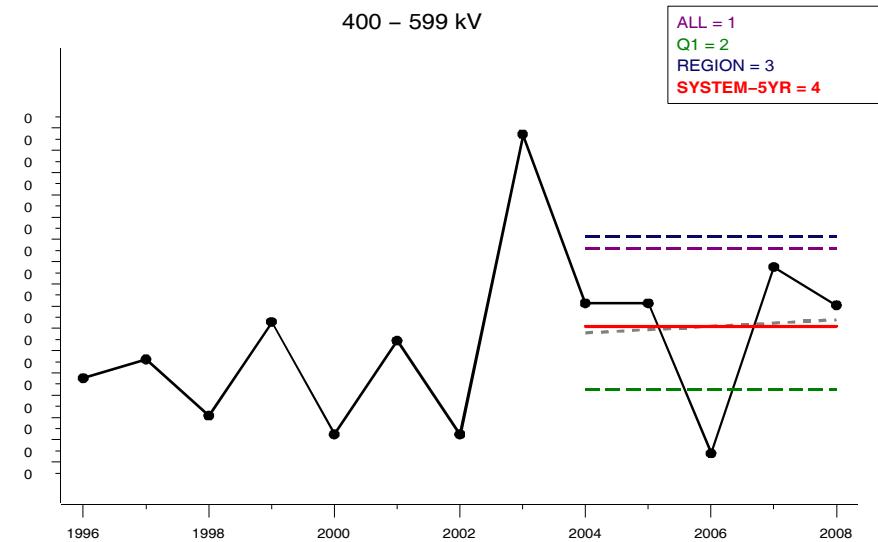
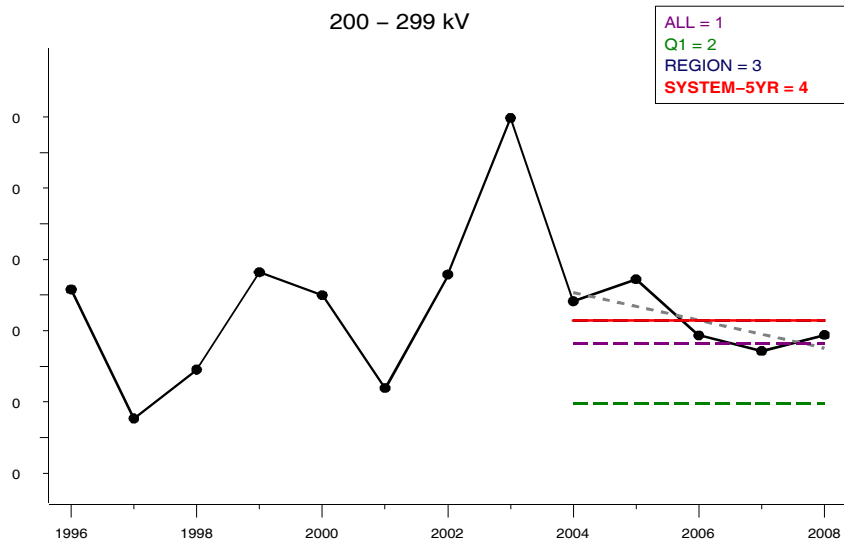
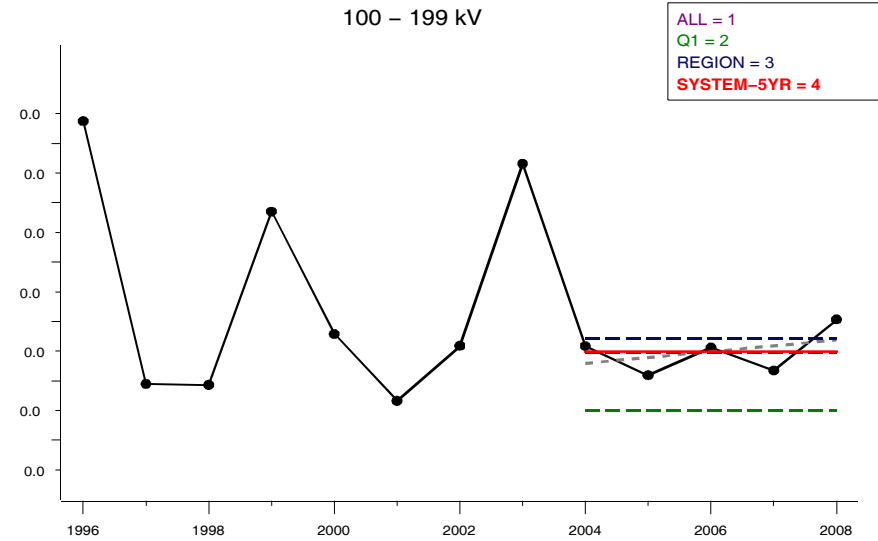
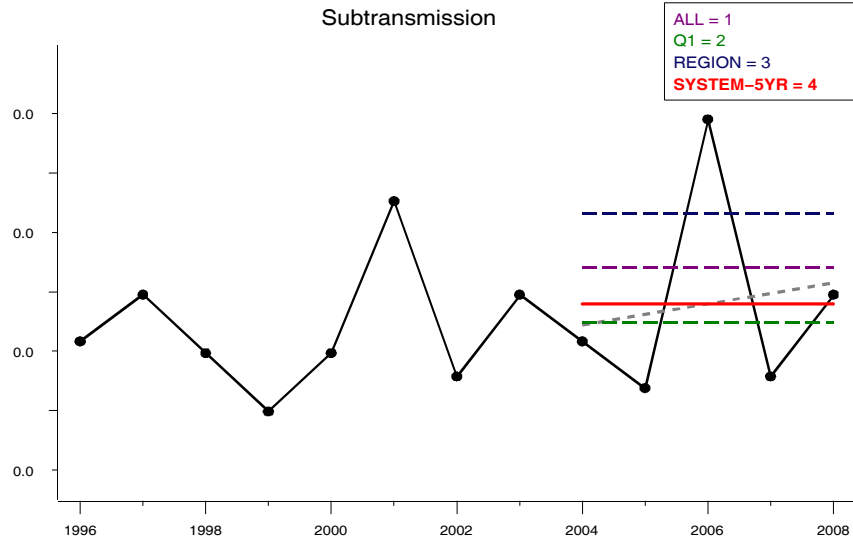
Five Years: 2004-2008, Voltage Class = XXX



Percent, Sustained Outages >= 1 Minute
Automatic Outages Only, No Screening Applied
HIGHER is Better

1.11.1

Circuit Total Outage Frequency, Mileage Adjusted (TCOF – NERC 11) 2009 SGS Transmission Reliability Benchmarking Study SAMPLE ENERGY



Automatic Outages – Sustained and Momentary
LOWER is better.
 Data prior to 2004 should be interpreted with caution.

Data Dictionary and Definitions for NERC TADS Output Data Files

	Spreadsheet Column Heading	NERC Explanation	Format	SAS Name
NERC TADS Metrics	ELEMENT TOTAL AUTOMATIC OUTAGE FREQUENCY (TOF - NERC 1)	Total Automatic Outages / Total Elements. No. Automatic Outages per Element per year	NUMERIC	TOF
	ELEMENT SUSTAINED OUTAGE FREQUENCY (SOF - NERC 2)	Total Sustained Outages / Total Elements. No. Sustained Outages per Element per year	NUMERIC	SOF
	ELEMENT MOMENTARY OUTAGE FREQUENCY (MOF - NERC 3)	Total Momentary Outages / Total Elements. No. Momentary Outages per Element per year. No. Momentary Outages per 100 Circuit Miles per year	NUMERIC	MOF
	ELEMENT SUSTAINED OUTAGE DURATION TIME (SODT - NERC 4) (HOURS)	Total Sustained Outage Hours / Total Elements. Average no. of Sustained Outages hours per Element per year	NUMERIC	SODT
	ELEMENT SUSTAINED OUTAGE MEAN TIME TO REPAIR (MTTR - NERC 5) (HOURS)	Total Sustained Outage Hours / Total Sustained Element Outages. Average no. of Sustained Outage Hours per outaged Element per year	NUMERIC	MTTR
	MEAN TIME BETWEEN SUSTAINED ELEMENT OUTAGES (MTBF - NERC 6) (HOURS)	(Total Element Hours - Total Sustained Outage Hours) / Total Sustained Element Outages. Mean (average) no. of hours of operation of an Element before it fails	NUMERIC	MTBF
	MEDIAN TIME TO REPAIR SUSTAINED ELEMENT OUTAGE FAILURES (MDTTR - NERC 7) (HOURS)	The time when 50% of the Mean Time to Repair minutes are greater than this figure. Median no. of Sustained Outage Hours per outaged Element	NUMERIC	MDTTR
	ELEMENT AVAILABILITY PERCENTAGE (APC - NERC 8)	$1 - (\text{Total Sustained Outage Hours} / \text{Total Element Hours}) * 100$	NUMERIC	APC
	PERCENTAGE OF ELEMENTS WITH ZERO AUTOMATIC OUTAGES (PCZERO - NERC 9)	Total Elements with Zero Automatic Outages / Total Elements	NUMERIC	PCZERO
	CIRCUIT TOTAL OUTAGE FREQUENCY, MILEAGE ADJUSTED (TCOF - NERC 11)	(Total Circuit Automatic Outages *100) / Total Circuits Miles. No. Automatic Outages per 100 Circuit Miles per year	NUMERIC	TCOF
	CIRCUIT SUSTAINED OUTAGE FREQUENCY, MILEAGE ADJUSTED (SCOF - NERC 12)	(Total Circuit Sustained Outages *100) / Total Circuit Miles. No. Sustained Outages per 100 Circuit Miles per year	NUMERIC	SCOF
	CIRCUIT MOMENTARY OUTAGE FREQUENCY, MILEAGE ADJUSTED (MCOF - NERC 13)	(Total Circuit Momentary Outages *100) / Total Circuit Miles	NUMERIC	MCOF
	Underlying Data	MOMENTARY OUTAGES UNSCREENED	The sum of momentary (<1 MINUTE) outages per circuit.	NUMERIC
NERC VOLTAGE CLASS		Four (4) voltages classes in NERC TADS: 200-299kV, 300-399kV, 500-599kV, 600-799kV. SGS Study also includes Subtransmission (<100kV), 100-199kV and aggregations into All Voltages Combined, Load Serving (<200kV) and Bulk Power (>=200kV)	CHARACTER	NERCCLAS
NUMBER OF CIRCUITS AT YEAR-END		Number of Circuits in service during the time period. Counts circuits in service for either the full or partial period and does not account for in service or retirement dates.	NUMERIC	N_CIRCUIT
NUMBER OF CIRCUITS EXCLUDED FROM BENCHMARKING COMPARISONS		A binary flag (0=Include, 1=Exclude) indicating circuits explicitly excluded from between-system benchmarking (shared) summaries, but INCLUDED in proprietary benchmarking and circuit output.	NUMERIC	EXCLUDE
NUMBER OF CIRCUIT-YEARS		Number of Circuit-Years for the strata (e.g., circuit, voltage class). This value may be used as the divisor to calculate transmission average statistics.	NUMERIC	N_YR

Data Dictionary and Definitions for NERC TADS Output Data Files

Spreadsheet Column Heading	NERC Explanation	Format	SAS Name
OVERHEAD CIRCUIT MILE-YEARS	Sum of circuit length multiplied by circuit-years, in miles. Used in mileage-adjusted statistic calculation.	NUMERIC	MILE_YR
SUM CIRCUIT LENGTH (MILES) AT YEAR-END	Total circuit length (overhead and cable) multiplied by the number of circuit-years, in miles	NUMERIC	LENGTH
SUM OF CIRCUITS WITH AUTOMATIC OUTAGES UNSCREENED	Total outages (number of outages AFTER collapsing successive or overlapping outages). No Screening of any kind is applied.	NUMERIC	PCZERO_SUM
SUM OUTAGE DURATION HRS UNSCREENED	Sum of Outage Duration (Decimal Hours). Excludes any duration from outage < 1 minute. No Screening of any kind is applied.	HOUR	DURATION_SUM
SUSTAINED OUTAGES UNSCREENED	Sustained (>= 1 minute) Outages.	NUMERIC	SUSTAINED_SUM
SYSTEM ID	Company or System Name. May also include company-level operating regions, geographic regions, All systems average or quartiles.	CHARACTER	COMPANY
SYSTEM REGION		CHARACTER	REGION
TOTAL OUTAGES UNSCREENED	Total outages (number of outages AFTER collapsing successive or overlapping outages). No Screening of any kind is applied.	NUMERIC	OUTAGE_SUM
YEAR	Year	NUMERIC	YEAR
CLASS	Description of the reporting strata (e.g., system level, voltage class and year)	CHARACTER	CLASS
VOLTAGE CLASS EXCLUDED FROM BENCHMARKING COMPARISONS	Voltage Class EXCLUDED from benchmarking comparisons, a binary flag (0=Include, 1=Exclude). Applied to voltage classes with 6 or fewer circuits, to protect anonymity.	NUMERIC	OMITCLAS

NERC TADS OUTPUT DATA FILES: <COMPANY>_NERC_ANNUAL_SYSTEM.CSV
 <COMPANY>_NERC_ANNUAL_CIRCUITS.CSV