Southwest Power Pool, Inc.

HUMAN RESOURCES COMMITTEE

Recommendation to the Board of Directors

January 25, 2006

Organizational Roster

The following members represent the Human Resources Committee:

Quentin Jackson, Chair	SPP Director
Phyllis Bernard	SPP Director
Trudy Harper	Tenaska
Harry Dawson	Oklahoma Municipal Power Authority
Mike Palmer	Empire District Electric Company
Richard Spring	KCPL

Background

The SPP Board of Directors adopted the SPP Performance Compensation Plan ("the Plan") at its October 25, 2005 meeting (see attached). The Plan was designed to increase the commitment of employees to attaining corporate goals, to promote the management of outcomes, to encourage qualified and trained employees to remain with SPP and to attract new employees by emphasizing operating performance through the opportunity for added compensation beyond the base salary. Target funding percentages will be applied to the actual base salary as of December 31 of the Plan year. All active employees as of December 31 of the Plan year are eligible to participate in the plan. Employees retiring, passing away, and/or claiming disability status during the Plan year will be eligible for benefits adjusted based upon the tenure of active employment during the Plan year.

The SPP Board of Directors approved modifications applicable solely to the 2005 plan year as detailed below:

- 2005 plan year funding targets are 50% of those detailed in the plan
- 2005 corporate modifier can range from -100% to 20%

The Human Resources Committee is responsible for reviewing actual performance versus the Plan's performance criteria and reporting to the SPP Board of Directors the results of their review and recommendations for funding of the completed Plan year.

Analysis

The Plan measures SPP's performance against three criteria:

- Cost Control (33% weighting): Actual Foundation expenditures compared to Foundation budget
- Stakeholder Satisfaction (33% weighting): Results determined by survey of customers, members, regulators, and vendors
- Reliability Parameters (34% weighting): Measures of SPP system availability and transmission system reliability

Cost Control: The Cost Control criteria measures SPP's actual expenditures in its "base or foundation" operations with those forecast in its Foundation budget. The Foundation budget concept is new to SPP for the 2006 fiscal year and, therefore, unavailable to measure against for this criteria. The added flexibility in the 2005 corporate modifier for the Plan was intended to address this weakness.

Absent the Foundation budget with which to compare performance, the HR Committee elected to request that SPP staff examine the 2005 budget and actual results and adjust those to represent a Foundation budget and Foundation actual results for 2005. The newly created Foundation actuals indicate expenses of $37.7 million compared to the Foundation budget of $39.3 million. Actuals were $1.6 million below budget or 95.95% of the Foundation budget. The comparison also took into account approved adjustments to the 2005 budget as approved by the SPP Board of Directors at their April 26, 2005 and July 26, 2005 meetings. The Human Resources Committee will use 95.5% for calculation of the Cost Control criteria.

The detail supporting the Cost Control analysis criteria follows as Attachment A.

Stakeholder Satisfaction: The Stakeholder Satisfaction criteria measure the perception of SPP's stakeholders (defined as members, customers, regulators, and vendors) on how well SPP is performing.

The HR Committee reviewed the results from SPP's Customer Satisfaction Survey ('the Survey") as well as the details of the survey. The Survey included numerous questions gauging a respondent's satisfaction with various aspects of their interaction with SPP across the functions SPP performs (i.e. tariff administration, impact studies, etc.). The Survey also included a summary question asking for a respondent's overall satisfaction with SPP's services. The summary question yielded an average response of 3.64 (5 being strongly agree, 1 being strongly disagree). Satisfaction across SPP's differing functions varied from a high score of 3.85 for Reliability Coordination and a low score of 2.79 for Market Implementation. Averaging the scores across SPP's primary functions yields a result of 3.43 (5 being the highest and 1 being the lowest, excluding responses from vendors). The Human Resources Committee will utilize the 3.43 result (average rating of SPP's services) for calculation of the Stakeholder Satisfaction criteria.

The detail supporting the Stakeholder Satisfaction analysis criteria follows as Attachment B

Reliability Parameters: The Reliability Parameter criteria includes several metrics designed to measure the reliability of SPP hosted systems (OASIS, RTOSS, ICCP) to ensure the systems are available to customers and members. Additionally, measures are in place to ascertain SPP's assessment of the transmission system and adherence to reliability criteria.

The HR Committee reviewed the report prepared by the SPP Operations staff detailing the reliability parameters and the Company's performance against those parameters. The Committee determined SPP's systems availability as follows:

- OASIS 99.96%
- RTOSS 99.88%
- ICCP 100.00%

The HR Committee determined one system availability measure was below 99.95%.

The HR Committee determined SPP had zero NERC RC violations during the 2005 Plan year.

The HR Committee also determined SPP's transmission system assessments were available as follows:

- Day Ahead Assessment 100%
- State Estimator 95.5%

The detail report from SPP's Operations Department follows as Attachment C

Funding Calculation: Below is the formula utilized by the HR Committee in calculating SPP's overall performance under the Plan:

X = (.33 x A) + (.33 x B) + (.34 x ((.36 x C) + (.32 x D) + (.32 x E))) where:

X = overall performance percentage

A = Cost Control funding target achieved

B = Stakeholder Satisfaction funding target achieved

C = System Reliability funding target achieved

D = NERC RC Violations funding target achieved

E = Transmission Assessment funding target achieved

Based on the analysis performed by the HR Committee we have assigned the following values to the formula variables:

The determination of factor "A", Cost Control Funding, was determined by comparing actual results (93% of budget) to the following table. "A" was determined to be 1.00.

Actual Foundation/Foundation Budget	Funding as % of Target
>115%	-100%
115%<X>110	0%
110%<X>105	50%
105%<X>95	100%
95<X>85	125%
< 85	150%

A = 1.00

The determination of factor "B", Stakeholder Satisfaction, was determined by comparing actual results (survey score of 3.43) to the following table. "B" was determined to be .70.

Overall Survey Results	Funding as % of Target
Very Dissatisfied (avg <2.5)	-100%
Somewhat Dissatisfied (2.5<avg<3.0)	0%
Satisfied (3.0<avg<3.8)	70%
Very Satisfied (3.8<avg<4.5)	100%
Extremely Satisfied (avg>4.5)	150%

B = .70

The determination of factor “C”, System Reliability, was determined by comparing actual results to the following table. “C” was determined to be 1.00.

Systems Availability, excludes scheduled maintenance

OASIS, RTOSS, ICPP Availability	Funding as % of Target
All under 99.5%	-100%
Two under 99.5%	0%
One under 99.5%	25%
One under 99.8%	75%
One under 99.95%	100%
All 99.99% or greater	150%

C = 1.00

The determination of factor “D”, NERC RC Violations, was determined by comparing actual results to the following table. “D” was determined to be 1.00.

NERC RC Violations	Funding as % of Target
>1	-100%
1	0
0	100

D = 1.00

The determination of factor “E”, Transmission Assessment, was determined by comparing actual results to the following table. “E” was determined to be 1.50.

Transmission Assessment Availability	Funding as % of Target
<99.5% DA and 90% SE	-100%
99.5% DA and 90% SE	10
99.8%DA and 95%SE	100
100% DA and 95% SE	150

E = 1.50

Inserting the above variable values into the above formula yields:

(A) (B) (C) (D) (E)

$$X = (.33 \times 1.00) + (.33 \times .70) + (.34 \times ((.36 \times 1.00) + (.32 \times 1.00) + (.32 \times 1.50)))$$

$$X = (0.33) + (0.231) + (0.3944)$$

X = 95.54%

This percentage is then applied towards the target funding level of the Plan to determine the percentage of payroll used to fund the performance compensation pool. For the 2005 Plan year, the SPP Board of Directors approved a recommendation to reduce the overall funding target by 50%, down to 7.5% from 15%. Therefore, the percentage of payroll used to fund the Plan for the 2005 plan year is calculated as follows:

Percentage of Payroll = .9554 x 7.50%

Percentage of Payroll = 7.17%

Payroll: The Plan defines the payroll data used in determining Plan funding to be the base salaries at the end of the Plan year. SPP's base salaries as of December 31, 2005 were reviewed by the HR Committee and total $13,193,412.

Plan Funding: The Human Resources Committee applied the formula calculation above against the base salaries of SPP at December 31, 2005 to arrive at a plan funding level of $945,374. The Human Resources Committee approved this recommendation by unanimous voice vote.

Recommendation

The Human Resources Committee recommends that the Southwest Power Pool Board of Directors approve funding for the 2005 SPP Performance Compensation Plan in the amount of $945,374. The SPP Board of Directors will allocate performance compensation payment for the SPP President. The SPP President will allocate performance compensation payments to the SPP staff.

Approved: Human Resources Committee January 25, 2006

Action Requested: Approve Recommendation

ATTACHMENT A

ACTUAL EXPENSES

		Adjustments						
	Jan - Dec 05	A	B	C	D	E	F	Adj. Actual
Expense								
Salary & Benefits	17,918	(43)	(92)	(203)	(22)	(127)	(959)	16,472
Employee Travel	716							716
Administrative	1,874		(15)	(263)		(418)		1,178
Assessments & Fees	8,708							8,708
Meetings	374							374
Communications	1,833			(896)				937
Maintenance	1,537					(5)		1,532
Leases	740							740
Outside Services	8,852			(289)		(104)		8,459
Regional State Committee	970			(970)				0
Debt Service	7,336							7,336
Total Expense	50,856							46,451
Less: Assessments & Fees	(8,708)							(8,708)
Total Controllable Expense	42,148							37,742

BUDGET

	Budget	A	B	C	D	E	F	Adj. Budget
Expense								
Salary & Benefits	19,250	(240)	(211)	(1,004)	(94)	(436)		17,264
Employee Travel	688							688
Administrative	1,940		(15)	(263)		(400)		1,262
Assessments & Fees	7,909							7,909
Meetings	399							399
Communications	3,159			(1,600)				1,559
Maintenance	2,819			(1,200)				1,619
Leases	746							746
Outside Services	8,553			(170)				8,383
Regional State Committee	1,423			(1,423)				0
Debt Service	7,414							7,414
Total Expense	54,300							47,244
Less: Assessments & Fees	(7,909)							(7,909)
Total Controllable Expense	46,391							39,335

Adjusted Expenses	37,742
Adjusted Budget	39,335
Difference	(1,593)
% Change from Adjusted Budget	95.95%

A = Current Reliability and Operations Support
B = Blackout Initiatives
C = Implementation of Imbalance Market
D = NERC Cyber Security Standard
E = SAS70 Audit
F = Mid Year BOD Approvals

ATTACHMENT B

CUSTOMER SATISFACTION SURVEY

Background

As part of the Performance Compensation Plan, a Customer Satisfaction Survey was conducted. An online survey was emailed to 246 members, customers, regulators and vendors on November 10, 2005; reminders were sent on November 17, 23, and 28. The respondents were encouraged to forward the survey invitation to others within their organization that had regular contact with Southwest Power Pool staff.

The following results are a compilation of the responses received and are presented to the Human Resources Committee for consideration in their decision regarding funding and payment of the Performance Compensation Plan.

Analysis

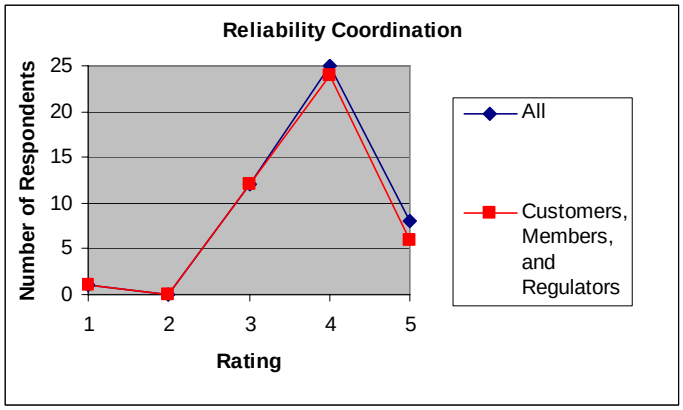
A total of 87 surveys were completed. The mix of respondents mirrors the composition of Southwest Power Pool's stakeholder mix.

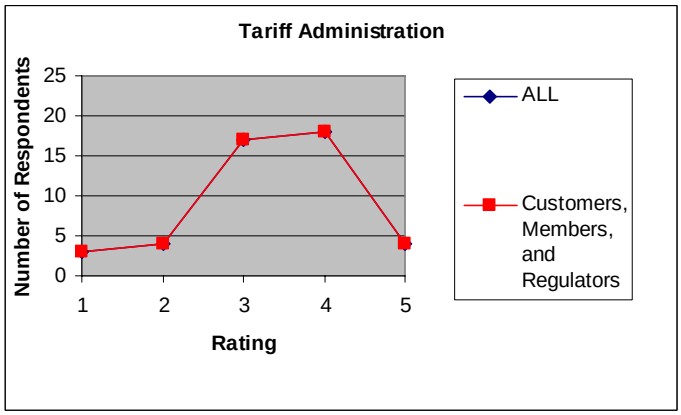
Members:	43	49%
Customers:	15	17%
Regulators:	7	8%
Vendors:	21	24%
Others:	1	1%

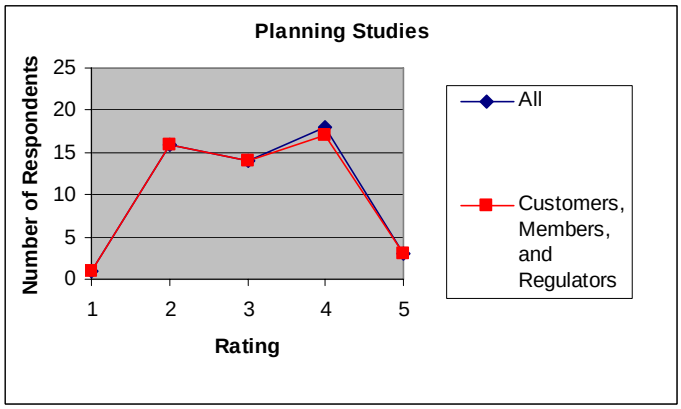
Of the respondents, 65% reported interaction with SPP staff on a weekly or more frequent basis.

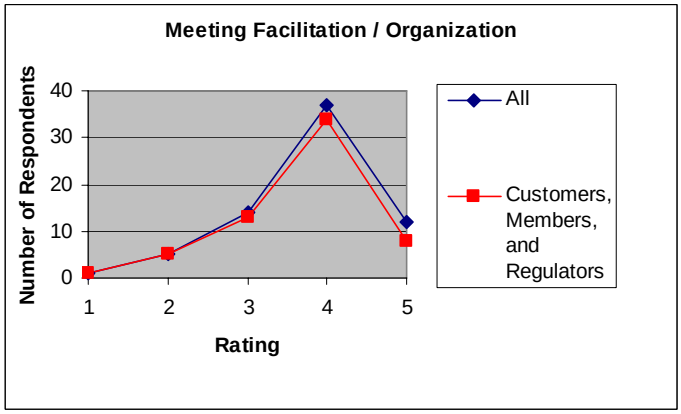
On the following charts, the rating (X Axis) ranges from 1 to 5 with 1 being "strongly disagree" and 5 being "strongly agree". The Y axis indicates the number of respondents for that question. In addition, the "All" line depicted on the chart is the total response by adding in responses from vendors.

ATTACHMENT B









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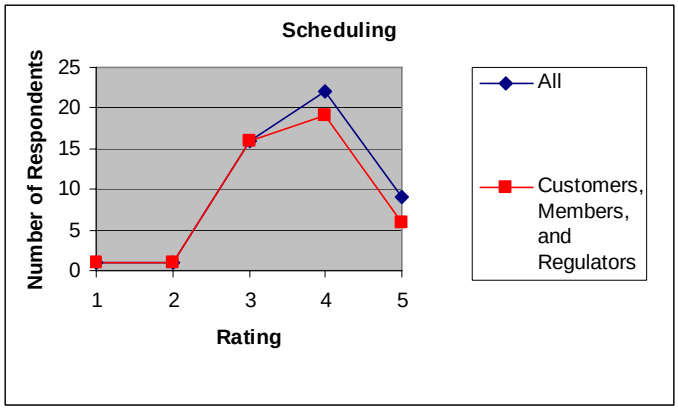

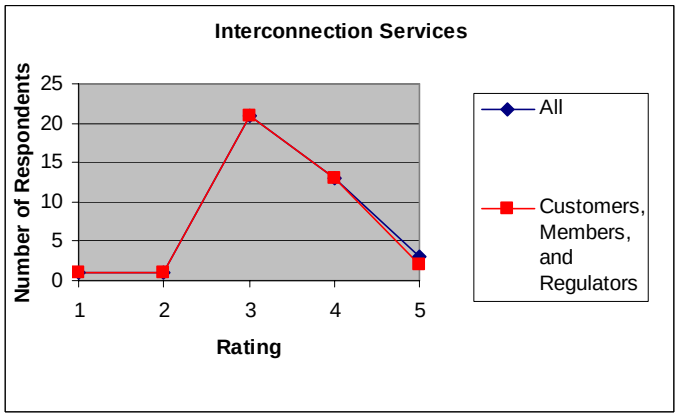

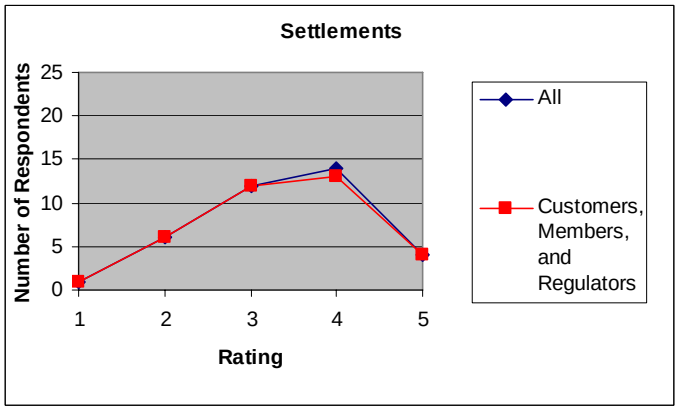

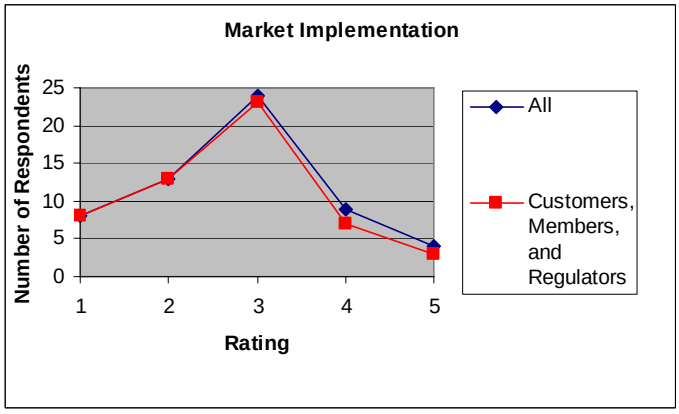

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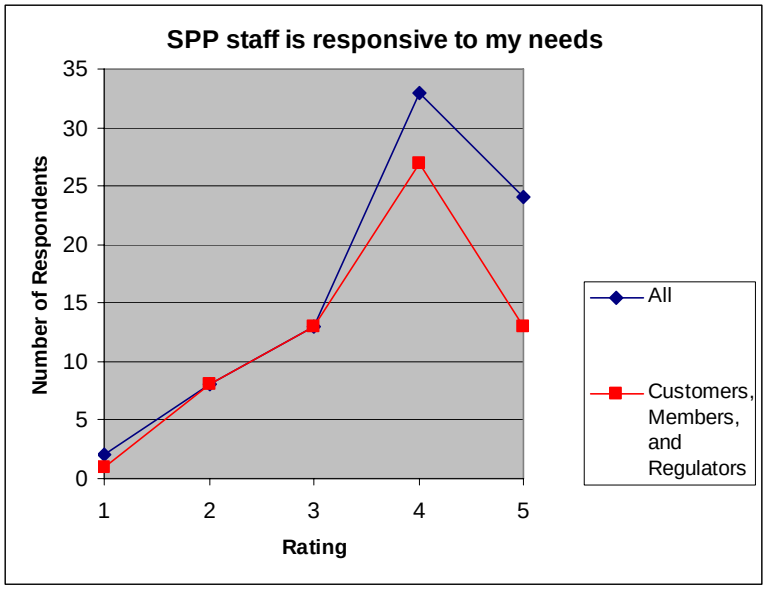

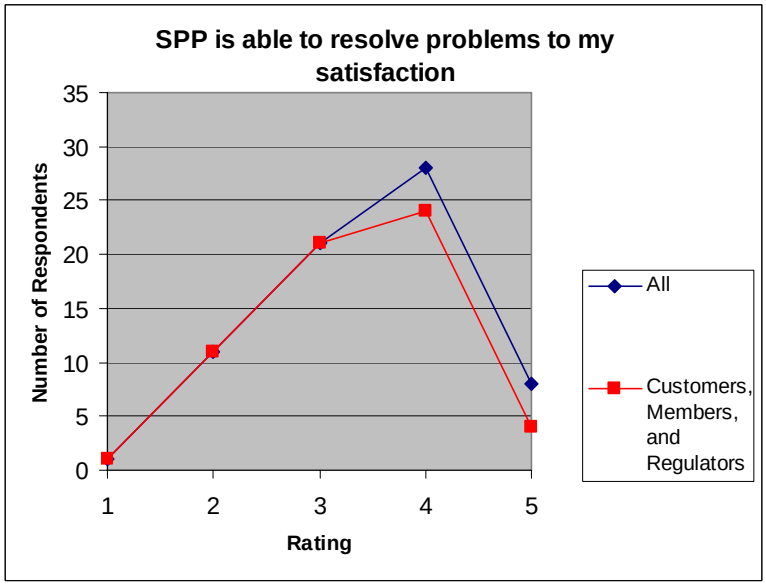

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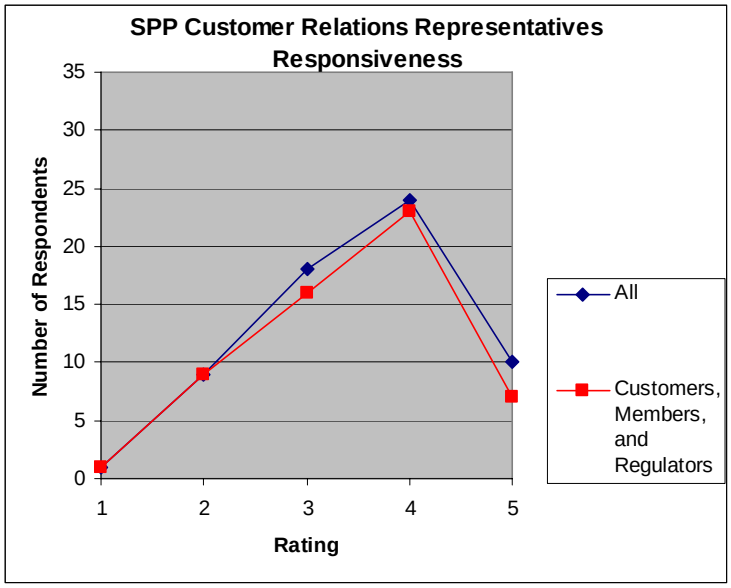

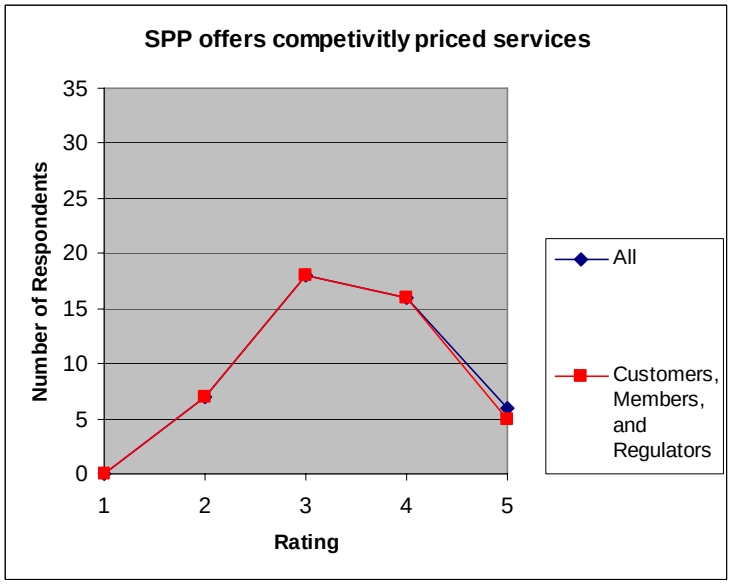

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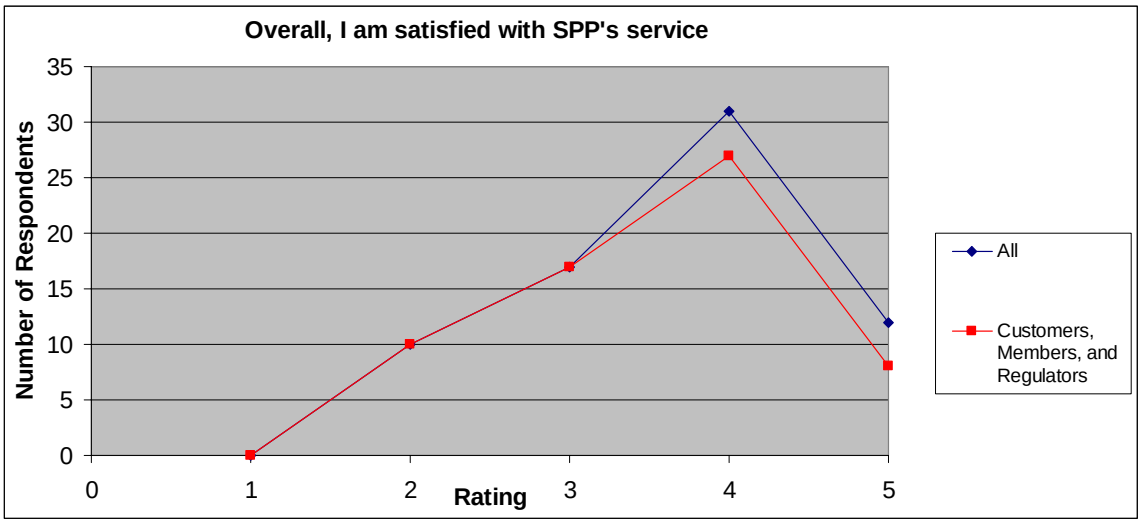

ATTACHMENT C

Memorandum

To: **Southwest Power Pool HR Committee**

From: **Carl Monroe**

Date: **January 26, 2006**

Re: **Operations Measurements for 2005**

Day-Ahead Transmission Assessment

Day Ahead Assessment for 2005 was: 100%.

Definition:

NERC Standard IRO-004-0:

Each Reliability Coordinator must conduct next-day reliability analyses for its Reliability Coordinator Area to ensure the Bulk Electric System can be operated reliably in anticipated normal and Contingency conditions. System studies must be conducted to highlight potential interface and other operating limits, including overloaded transmission lines and transformers, voltage and stability limits, etc. Plans must be developed to alleviate System Operating Limit (SOL) and Interconnection Reliability Operating Limit (IROL) violations.

SPP Measurement:

The SPP Reliability Coordinator is responsible for conducting the next day reliability analysis. Each Reliability Coordinator shares with other RCs data that represent their knowledge of operations for the next day. This includes generator and transmission outages, unit commitment orders, load forecasts, transmission reservations, etc. This data is imported with the same data for SPP into the power flow analysis package. The SPP Reliability Coordinator will use that data to simulate the operation of the transmission system for the next-day. This includes additional analysis using what-if scenarios. When the results are completed the SPP Reliability Coordinator saves the results and cases. As part of the most recent NERC review of SPP Reliability Coordination, NERC validated that SPP had the systems, procedures, and personnel to perform this function.

Attached are 1) Procedure for Daily and Day-Ahead Reliability Assessment, 2) Checklist for Running Daily Load Flow and 3) A screen print showing a list of the save cases that Operations saved for 2005.

Note each day is represented by a save-case, therefore the day-ahead reliability assessment was performed each day which would equal 100%.

State-Estimator Transmission Assessment

State Estimator Transmission Assessment for 2005 was: 95.5%.

Definition:

NERC Standard IRO-005-0

The Reliability Coordinator must be continuously aware of conditions within its Reliability Coordinator Area and include this information in its reliability assessments. The Reliability Coordinator must monitor Bulk Electric System parameters that may have significant impacts upon the Reliability Coordinator Area and neighboring Reliability Coordinator Areas.

SPP Measurement:

The SPP Reliability Coordinator uses a tool called the State-Estimator to assess the current state of the bulk-power transmission system. This tool uses the real-time data gathered from SPP transmission owners as well as other neighboring transmission owners. This data is raw from the field and can contain various types of errors. The SE takes all the measurements from the field and uses statistics and redundancy of measurements to determine which values are valid and to determine the current state of the transmission system including flows and voltages. The Reliability Coordinator then can observe any reliability issues or problems. Also, the SE results are used to perform other analysis like what-if contingency analysis.

A script was developed early last year to write from the Energy Management System the results of every run performed by the EMS to a file. The result can either be “solved” or “unsolved”. Determination of “solved” versus “unsolved” is based on certain configurable parameters, with possibly the most critical one being maximum bus mismatch. The maximum bus mismatch level is generally set at either 99 MW on weekdays and 150 MW on weekends. If the run was solved with excess mismatch, it is characterized as “unsolved”. In any event, the result is automatically written to a file and cannot be overwritten. Measurements collected by SPP since 4/4/2005 (first date of measurement) show there were 77476 runs with 74001 solutions which equals 95.5% availability of valid SE results.

Reliability Coordinator Violations

Reliability Coordinator Violations for 2005 was: 100%.

Reliability Coordinator Violations

Definition:

NERC Standard IRO-005-0 Requirement R-17:

When an IROL or SOL is exceeded, the Reliability Coordinator shall evaluate the local and wide-area impacts, both real-time and post-contingency, and determine if the actions being taken are appropriate and sufficient to return the system to within IROL in thirty minutes. If the actions being taken are not appropriate or sufficient, the Reliability Coordinator shall direct the Transmission Operator, Balancing Authority, Generator Operator, or Load-Serving Entity to return the system to within IROL or SOL.

SPP Measurement:

SPP is required as part of the NERC Compliance program to monitor and report any IROL or SOL violation that exceeds 30 minutes. Each morning Operations Engineering reviews the previous day's operations. Part of the review is reviewing the alarm lists of SPP. This alarm list would show any limit that was exceeded by more than 30 minutes. There were no occurrences of violations.

I have reviewed and verified these results and find them to be accurate.

Signed,

Carl A. Monroe

Sr. VP, Operations and COO

Southwest Power Pool

ATTACHMENT C

System Availability

Availability:

- OASIS: Between 99.964% and 99.979 percent (see discussion below)
- RTOSS: 99.882 percent
- WebData: 99.429 percent
- ICCP: 100.00 percent

The justification for the reported availability is discussed below. Please bear in mind that even though the unavailability of WebData resulted in the inability to electronically send the Net Scheduled Interchange and schedule data to SPP members requesting the data, the data is visible to the members via the RTOSS user interface whenever RTOSS is available.

Background:

Availability of the OASIS, RTOSS, and ICCP systems are being reported. Availability consists of two components, server availability and application availability. Availability is further impacted by the redundancy built into the system, meaning that even though a given server had less than 100% availability, it is possible that the application maintained 100% availability due to the built-in redundancy. Availability is also impacted by the networking and communications systems and circuits used by SPP members to reach the systems.

OASIS is configured with a single web server (no redundancy) and a pair of clustered database servers. The clustered database servers provide sufficient redundancy such that as long as the database service successfully fails over from one cluster node to the other in the event of a failure, availability of the database is maintained.

The scheduling system consists of two major subsystems. The RTOSS system itself is outsourced to OATI, in Plymouth, MN. OATI provides redundant web and database servers in their primary datacenter and hosts additional redundancy of the RTOSS system in their Disaster Recovery datacenter. The second subsystem is the WebData database deployed at SPP. WebData is a local repository of scheduling data that is used by SPP systems and is also forwarded to SPP members at their option. WebData also receives the Net Scheduled Interchange data from RTOSS and forwards the data to the ICCP servers for transmittal to the SPP members. The WebData database consists of a clustered pair of database servers at the Plaza West site and a second, clustered pair of database servers at the AECC backup site. As with the OASIS database cluster, the database service will fail over to the standby server in the cluster in the event the primary server fails. In the event of a complete failure of the WebData cluster at the Plaza West site, the WebData cluster at the AECC backup site assumes the primary role with some manual reconfiguration work required by both SPP and member support staff. All scheduling data, including the Net Schedule Interchange values are visible to the SPP Schedulers and SPP membership through the OATI-hosted systems, regardless of the status of the WebData system.

ICCP consists of a redundant pair of servers at the Plaza West site and a second, redundant pair of servers at the AECC backup site. Each pair is configured as primary/standby at both sites, and the servers at both sites are online and operational. SPP members are required to transmit their real-time operational data to both the Plaza West and the AECC backup sites concurrently. Data is fed into the Energy Management System from both the Plaza West and AECC backup site servers in a configuration described as High Availability ICCP. As long as either site has an operational ICCP server receiving data from the remote connections, data availability into the EMS can be maintained at 100%. The High Availability configuration also permits SPP members to receive real-time data, including Net Scheduled Interchange, from both the Plaza West and AECC backup site ICCP systems concurrently, at the member's option.

Connectivity to the OASIS servers is supported by fully redundant Internet circuits. Member access to the WebData and ICCP systems is supported by fully redundant SPPNET frame relay circuits. In the event of a circuit failure, the data is routed automatically over the alternate data circuit. Within the Plaza West facility, the local area network is also redundant, maintaining high availability through the ability to provide alternate routing in the event of a networking hardware component failure.

Server Availability:
Server availability is defined as the server booted up, connected to the network, and reachable by the users. Server availability does not mean that the installed application is operating properly. Server availability is measured using the system shutdown and startup events recorded in the system event logs. All server outages are reported to SPP management monthly and are classified as planned and unplanned. For the purposes of server availability, only unplanned outages are reported as down time. The server availability percentages are specific to the server reported and do not take into consideration any system redundancy that would maintain application availability. The system availability derived from the event logs does not reflect component failures, such as network interface or disk problems that impact the application availability but do not result in a failure of the server itself.

The 2005 server availability is as follows:
Plaza West systems:
- ASHDOWN: OASIS Web Server 99.987 percent available
- DEFIANT: Node 1 of the OASIS Database Cluster 100.00 percent available
- VOYAGER: Node 2 of the OASIS Database Cluster 99.999 percent available
- LRICPA: Node 1 of the ICCP server pair 99.989 percent available
- LRICPB: Node 2 of the ICCP server pair 99.997 percent available
- SPPWEBDATADB1 Node 1 of the WebData Database Cluster 99.996 percent available
- SPPWEBDATADB2 Node 2 of the WebData Database Cluster 99.998 percent available

AECC Backup Site systems:

- BKICPA: Node 1 of the ICCP server pair 100.00 percent available
- BKICPB: Node 2 of the ICCP server pair 100.00 percent available
- DRSOATIA: Node 1 of the WebData Database Cluster 100.00 percent available
- DRSOATIB: Node 2 of the WebData Database Cluster 99.999 percent available

Communications Circuits Availability:
The redundant Internet service is configured using two Internet Service Providers, MCI and SBC (now known as AT&T). Rerouting between the providers is an automatic function of the world-wide Internet communications backbone. Under the rules of operation, local Internet Service Providers are obligated to update their routing tables at least once every 24 hours. First tier and most second tier providers update far more frequently, often in minutes. In the event of a failure of the Internet path being used by a particular SPP member's service provider, connectivity will be lost until the member's Internet Service Provider updates the local routing tables. This is entirely beyond the control of SPP or SPP's local service providers.

The redundant SPPNET frame relay circuits are also configured using two service providers, MCI and AT&T. Fail over is an automatic function of the way SPP has configured the routers at the SPP and member sites. All routing is internal to the network, thus all that is necessary to force the fail over is the detection by the router of a circuit failure. All SPP member control areas have been configured with redundant SPPNET circuits. A number of non-Control Area members have chosen to not implement the secondary (AT&T) SPPNET circuit.

The 2005 communications availability is as follows:
Internet:
- MCI: 100% available
- SBC: 100% available
- Combined: 100% available

SPPNET (redundant configurations only):
- MCI: 99.69% available
- AT&T: 99.95% available
- Combined 99.993% available

The combined SPPNET availability of 99.993% reflects a concurrent outage of both the MCI and AT&T circuits into City of Lafayette for 37 minutes as a result of Hurricane Rita. All other SPP member sites configured with redundant SPPNET circuits achieved 100% combined availability for the year.

Not reflected in the above statistics is the SPPNET connectivity between the Plaza West and AECC backup sites. Due to an oversight, the direct connectivity between the two sites is only configured on the MCI circuit. A failure of the MCI circuit will affect access to the backup site systems if the data is routed over SPPNET from Plaza West to the AECC backup site. This is only an issue with RTOSS and the WebData servers. RTOSS transmits data to WebData via SPPNET. A failure of the MCI Private Virtual Circuit (PVC) on November 20, 2005, resulted in a loss of communication with the WebData

Server at the AECC backup site for 8 hours and 35 minutes. This outage is included in the WebData application availability statistics reported below because SPP was running on the backup site WebData system at the time. Even though OATI had a defined logical path (private virtual circuit) directly to the AECC backup site on both the MCI and AT&T circuits, the MCI circuit router did not detect the PVC failure because the physical circuits all remained up. As a result, the OATI router continued to attempt to route data to the WebData servers via the "lower cost" MCI circuit through the Plaza West routers. SPP staff implemented a routing workaround to restore connectivity and is working on a permanent solution, expected to be implemented before the end of February 2006.

Applications Availability:

OASIS application availability is defined as both the OASIS web service (running on ASHDOWN) and the SQL database (running on the DEFIANT and VOYAGER database cluster) being available. The web service is unavailable any time the server itself is down. The SQL database is down any time both nodes in the cluster are down, the database does not properly fail over (neither node assumes the primary role), disk hardware problems prevent the database from being brought online, or the database is corrupted and unusable. Detailed records of OASIS application outages were not kept in 2005. The applications support staff reported one outage with a duration of 45 minutes in 2005 when the database did not fail over as expected. The applications staff also reported brief outages totaling approximately 1.25 hours as the database cluster failed over between one node and the other, although there was no correlation between planned and unplanned outages. There was no failure due to database corruption. Using best and worst case scenarios, OASIS database outage ranges between 45 minutes and two hours. When combined with the availability of the web server, OASIS availability is between 99.964 percent and 99.979 percent

RTOSS application outages were logged in detail by the SPP schedulers. Per their detailed logs, the RTOSS system hosted at OATI had 99.882 percent availability. The WebData system had 99.429 percent availability. This availability includes both the 8 hour, 35 minute communications failure discussed previously and a corruption of the SQL database due to a hardware problem that took over 20 hours to recover. At the time of the SQL database failure, user access to the WebData application at the AECC backup site was not fully configured and thus could not be immediately made available.

With the implementation of High Availability ICCP in 2004, ICCP data was continuously available to the SPP Energy Management System during 2005. The High Availability ICCP configuration permits alternate sourcing of data, thus maintaining data availability even when the ICCP nodes are being failed over at either the Plaza West or AECC backup site for any reason. As there was never an instance where ICCP was down at both the primary and backup sites, ICCP system availability is reported as 100 percent.

ATTACHMENT C

Reliability Assessment Process and Procedure Overview

The daily and next day reliability assessments are broken into three major components in regards to building the cases. Once cases are built and solved, both a contingency analysis (N-1) and a flowgate analysis are performed. Current and Next day analyses are identical in process, but differ in data input.

Process 1: Set Generation, Load, NSI.

User enters date and time for study. Typically the study is run for the peak hour. Output files are created during the process that document what data is being read and whether or not the case has solved successfully for each area.
Process automatically performs the following:

- Loads operational model basecase and saves as desired assessment case (i.e., either current day or next day)
- Reads load forecast data and scales load accordingly
- Reads NSI data from AFC process and sets NSI in model.
- Losses are approximated based on new load data.
- Generation needs are then calculated (Gen = Load + Loss + NSI).
- Summation of new NSI is calculated and any difference is applied to external equivalents.
- Generation, load, and NSI are set for each area and the case is solved after each area is set.
- DC ties are set as either a load or generator depending on the direction of flow.
- Area interchange is enforced for the final solution.

User then solves again manually and reviews output files.

Process 2: Take transmission outages

User enters date and time for desired study.
Output files are created during the process that document what data is being read and whether or not the case has solved successfully for each area.
Process automatically performs the following:

- Reads transmission outage file for specified date and time.
- Reads mapping file to map outages to model.
- Outages appropriate lines in the model one area at a time and solves after each area's outages are taken.
- Performs final solution with area interchange enforced.

User then solves manually and reviews output files.

Process 3: Take generation outages / set generator dispatch

User enters date and time for desired study.
Output files are created during the process that document what data is being read and whether or not the case has solved successfully for each area.
Process then automatically performs the following:

- Reads generation dispatch file. (This file is created daily from member supplied data or based on real-time trending)
- Reads mapping file.
- Removes units from service that are scheduled to be out.
- Sets unit dispatch one area at a time then solves after each area is set.
- Performs final solution.

User then solves again manually and reviews output files.

Contingency Analysis:

Process automatically –
Runs a DC screen on defined areas and creates an output file with DC contingencies. Reads the DC output file and runs a full AC analysis on those contingencies as well as some predefined complex contingencies. A voltage screen is incorporated in the AC analysis.

Flowgate Summary:

Process automatically –
Reads pre-contingent flows for defined flowgates from the case then reads post contingent flows after the contingency element is outaged.
Output file is created listing pre- and post-contingent flows and % of rating.

Results:

Both the contingency analysis and flowgate summary are reviewed. Any contingency overloads that show up are studied to verify authenticity. Occasionally overloads show up because of some problem that occurs during the powerflow process (i.e.; an outage that failed to be entered in the outage scheduler). These errors are manually corrected and the contingency and flowgate analysis are run again. Any authentic overload that shows up is then further studied using real time EMS data and the affected control area(s) is then contacted. Most of the time control areas that have contingency overloads that show up on a regular basis have an operating guide in place to mitigate the condition. SPP operators / engineers verify this with the control area. For all other contingency overloads SPP engineers would work with the control area(s) to develop an operating guide for the condition.

ATTACHMENT C

CHECKLIST FOR RUNNING THE DAILY LOAD FLOW MODEL

Can Start after Ld & Cap Report Spreadsheet has been completed

☐ 1) Open program by clicking on the **PSS/E** icon.

☐ 2) Close the **Flowgate Trend** display
Run **"Forecast"**

☐ 3) Run **"Nostradamus"**

☐ 3a) Check **"Hourly Graphs for CA's"**

☐ 4) Run **"Load Lite"**

☐ 5) Click on **Copy t/gfmt**

FDNS Settings
Tap Adjustment - Stepping
Phase shift adjustment
Adjust switched shunts
Tie Line Only
Apply Immediately
Fixed slope decoupled Newton-Raphson

☐ 6) Click on **"NewLFDIR"**

☐ 7) Run **"NewcdPF"**
Solve by running **FDNS** &
Save by typing save * **}***
Check 'd:\newpf\working\invalid.solution.txt' for areas not soved in model

Enter today's date in the following format:
dd-mmm-yyyy-hh-mm ex:12-MAY-2003-17-00

☐ 8) Click on **"Seven Day"** button

☐

☐ 9) Run **"Transoutages"**
Solve by running **FDNS** &
Save by typing save *

Enter today's date in the following format:
yyyymmddhh ex:2003051415

☐ 10) Run **"Genoutage"**
Solve by running **FDNS** &
Save by typing save *

Enter today's date for the outage:
Use 17:00 for the time

☐ 10a) Click on **"Gensummary"**

☐ 11) Run **"Cont_An"**
Print file "contoday.txt" (d:\dlfm\working)

☐ 12) Run **"Flowgates"**
Print file "fgsummary.txt" (d:\dlfm\working)

HAVE THE CONTINGENCY ANALYSIS AND FLOWGATES CHECKED FOR ERRORS BY OPERATIONS ENGINEER BEFORE GIVING TO ROBERT (WEEKDAYS ONLY)

☐ 13) **After 1300** Open program by clicking on the PSS/E icon.

☐ 14) Click on **"NewLFDIR"**

☐ 15) Run **"NewndPF"**
Solve by running **FDNS** &
Save by typing save * **}***
Check 'd:\newpf\working\invalid.solution.txt' for areas not soved in model

Enter ***tomorrow's*** date in the following format:
dd-mmm-yyyy-hh-mm ex:12-MAY-2003-17-00

☐ 16) Run **"Transoutages"**
Solve by running **FDNS** &
Save by typing save *

Enter ***tomorrow's*** date in the following format:
yyyymmddhh ex:2003051415

☐ 17) Run **"Genoutage"**
Solve by running **FDNS** &
Save by typing save *

Enter ***tomorrow's*** date for the outage:
Use 17:00 for the time

☐ 18) Run **"NextDay_CA"**
Print file "conres1.txt"

☐ 19) Run **"NextDay_FG"**
Print file "fgsummary1.txt"

If any problems arise call: Mike Riley or Katy Carter

HAVE THE CONTINGENCY ANALYSIS AND FLOWGATES CHECKED FOR ERRORS BY OPERATIONS ENGINEER BEFORE GIVING TO ROBERT (WEEKDAYS ONLY)

*Updated 1/17/05 saved as o:/security/security documents/Powr flw checklist.xls

ATTACHMENT C

Seven-Day Analysis Process Overview

In order to take a more proactive approach to maintaining a reliable transmission system, it was deemed necessary to analyze the transmission system conditions (Contingency, Flowgate, and Voltage Analysis) from current day to seven days out. In order for this process to accurately represent the system conditions of the appropriate days, transmission outages, generation outages and generation dispatch are all taken into account for the creation of the seven-day power flow cases.

The Seven-Day Analysis process is dependant upon the current day power flow process. The dependence comes from the current day power flow process creating "base cases" for the Seven Day process by taking the base case (which is based off the NERC IDC base case) and populating it with data that reflects the anticipated peak system conditions. The following data is supplied by members daily and are included in the case: load forecast and unit commitment data. Additionally, the case is populated with data from the NERC Tag Dump and RTO_SS data to determine NSI for SPP control areas. Data from first tier control areas and beyond are obtained from NERC SDX data and from NERC tag dump data. Once the case is built and solved, the case is cloned into 5 cases and saved into the Seven-Day Analysis folder.

Once the Seven Day Power Flow base cases have been created, they are passed through a script that executes a contingency, flowgate, and voltage analysis. The final product of the Seven-Day Analysis Process is three reports for each day studied: Contingency, Flowgate, and Voltage Analysis. These reports are viewed by Operations Engineering and are also posted on the OPS1 site for member review. Based on these three reports, the system condition for each day can be viewed quickly and researched, if necessary.