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AZ CORP COMMISSION
DOCKET CONTROL

October 25, 2010

Ms. Carmel Hood
Docket Control Center
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

RE: Navajo Transmission Project (NTP), Self-Certification Letter for Decision No. 63197 and Docket No: L-00000U-00-0103

Dear Ms. Hood:

Enclosed is a Self-Certification Letter detailing the status of Dine Power Authority's (DPA) Navajo Transmission Project (Decision No. 63197) for 2008. This Self-Certification letter addresses the stipulations that were issued in the Certificate of Environmental Compatibility for the project. Thirteen copies and one original draft have been provided for your review and distribution.

DPA appreciates the opportunity to provide you with this information. Please direct any comments or questions to Mr. Ben Hoisington, Project Administrator, or myself at DPA, office telephone number 928-871-2133.

Sincerely,

DINÉ POWER AUTHORITY

Steven C. Begay
General Manager

Arizona Corporation Commission
DOCKETED

OCT 29 2010

DOCKETED BY

Enclosure

cc: Ben Hoisington, DPA
Arlene C. Arviso, DPA
file

CONDITION 1

This authorization to construct the new transmission line will expire 10 years from the date the Certificate is approved by the Arizona Corporation Commission, unless construction is completed to the point that the line is capable of operating at its rated capacity by that time; provided, however, that prior to such expiration the Applicant may request that the Arizona Corporation Commission extend the time limitation.

RESPONSE

Diné Power Authority (DPA) expects to construct the Navajo Transmission Line within the timeframe designated in the Certificate. If the proposed project construction schedule is delayed for some reason, then DPA will request an extension of the 10-year time limitation. DPA is currently reviewing the results of the initial system impact study report, which includes Segment 1 of the Navajo Transmission Line. This and the path rating study will be providing as part of a future submittal.

CONDITION 2

The corridor for the new transmission line will not exceed 1,000 feet.

RESPONSE

Final design for this project is not complete; however, the corridor within which the transmission line will be constructed and operated will not exceed 1,000 feet.

CONDITION 3

The new transmission line will be built in accordance with the mitigation measures specified in the final construction, Operation, and Maintenance Plan (COMP) concerning the Project. In the event that the new line is constructed along the alternative route described in the application, the Applicant shall ensure that the COMP specifically addresses the alternative route.

RESPONSE

As requested by the federal lead and cooperating agencies the COMP has been renamed the Plan of Development (POD) and is being updated to include current resource, management, and construction information. The Applicant intends to construct the proposed route authorized in the Certificate of Environmental Compatibility Application; however, a final decision regarding this alignment has not been made. Should the Applicant choose to construct the alternative route identified in the Application, all necessary permits will be acquired and modifications to the POD will be completed prior to construction.

CONDITION 4

The Applicant will comply with all existing air and water pollution control standards and regulation, and will all existing applicable ordinances, master plans, and regulations of the State of Arizona, Coconino, Yavapai, and Mohave counties; and any other governmental entities having jurisdiction.

RESPONSE

Final design work for this project has not been completed and construction has not commenced. The Applicant will comply with all existing air and water pollution control standards and regulations, and with all existing applicable ordinances, master plans, and regulations of the State of Arizona; Coconino, Yavapai, and Mohave counties; and any other governmental entities having jurisdiction during the construction and operation of the transmission line.

CONDITION 5

Construction of the new transmission line on non-reservation land shall not begin until Segment 1, as described in the application, has been constructed and is capable of operating at its rated capacity. However, in the event that all rights-of-way and regulatory approvals have been received for Segment 1 and 3 of the Project, financing has been procured for Segment 1 and 3, and construction of Segment 1 has begun, then construction of the non-reservation portions of the Project may begin prior to the completion of Segment 1, as long as Segment 1 is completed, energized and capable of operating at its rated capacity, prior to Segment 3 begin energized.

RESPONSE

Final design work for this project has not been completed. The Applicant intends to design and construct Segment 1 as the initial development of the proposed transmission line and will comply with the requirements for the sequencing of construction, as stipulated in Condition 5.

CONDITION 6

The Applicant will become a member of the Western States Coordinating Council (WSCC) and will file with the Arizona Corporation Commission a copy of the Applicant's WSCC Reliability Criteria Agreement.

RESPONSE

DPA will apply to the WSCC (now called the Western Electricity Coordinating Council [WECC]) prior to the construction of the Project. DPA provides annual updates to the WECC regarding the NTP status.

CONDITION 7

The Applicant will provide the Arizona Corporation Commission copies of interconnection studies concerning the Project as and when such studies are performed.

RESPONSE

DPA is submitting two reports. The first report is entitled, Navajo Transmission Project (Segment 1), WECC Comprehensive Progress Report, dated December 1, 2006. The second report is entitled, WECC Regional Planning Project Review Report, Navajo Transmission Project Segment 1 (NTP 1) Draft, Rev. 2, dated February 1, 2007. DPA will continue to keep the Arizona Corporation Commission informed about any other interconnection or related studies.

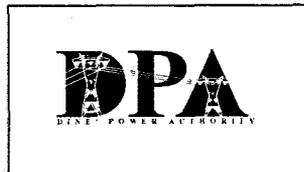
Navajo Transmission Project (Segment 1)

WECC Comprehensive Progress Report

December 1, 2006

Report Prepared By:
Arizona Public Service

Investigators:
Barrie Kokanos, PE
Abhishek Singh
Vincent Thor



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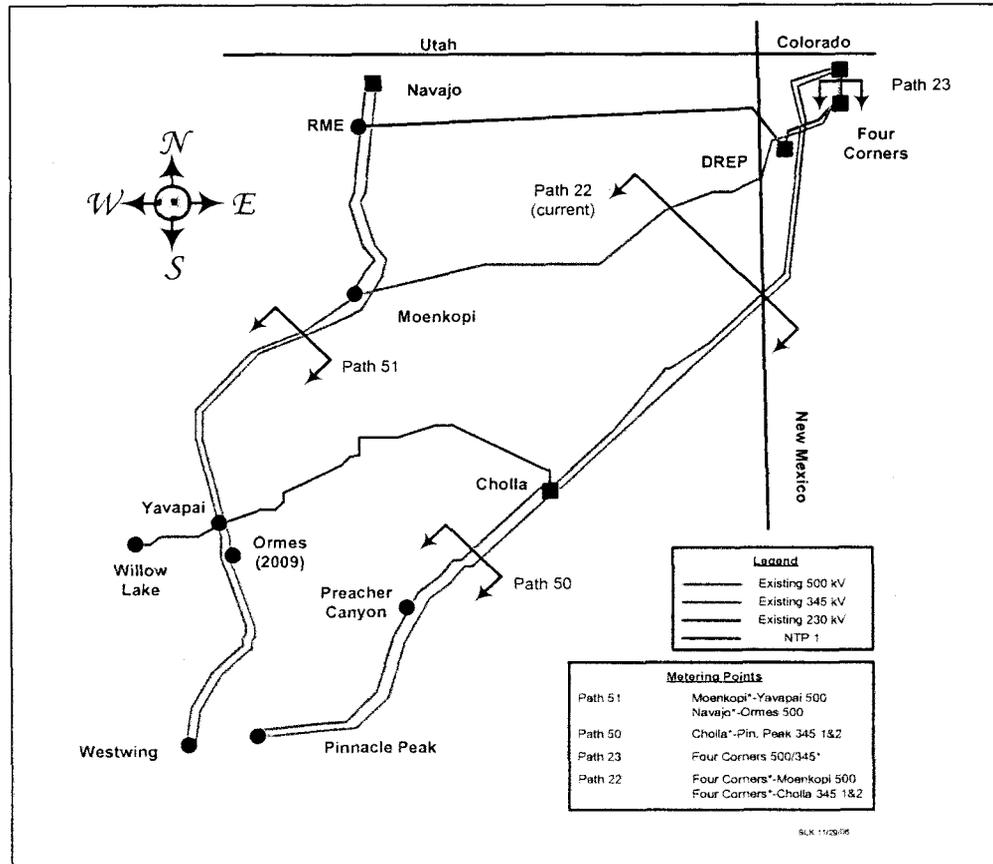
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I. Executive Summary

On March 10, 2006 Arizona Public Service (APS) Company submitted on behalf of Dine Power Authority (DPA) a notification letter to WECC to initiate the Project Rating Review process for the Navajo Transmission Project Segment 1 (NTP 1). As outlined in the WECC *Policies and Procedures for Regional Planning Project Review, Project Rating Review, and Progress Reports* manual, APS began (i.e. acting as project sponsor) a Comprehensive Progress Report (CPR) study to obtain an accepted east-to-west rating for the project. APS also initiated through a second letter the WECC Regional Planning Project Review process to demonstrate compliance with the WECC's Regional Planning Guidelines. The purpose of this report is to provide the results of the CPR study and to discuss any future study issues. Prior to this report, there had been no formal Initial Progress Reports published regarding NTP 1 and the project is currently in Phase I of the Project Rating Review process. The in-service date for this project is summer 2010 and the project is in the final stages of permitting.

Figure 1 shows the geographic location of the project along with other relevant lines, paths, and metering points. The proposed plan of service for NTP 1 can be seen in Figure 2.

Figure 1



A listing of major facilities required to support the plan of service as determined by study results is given below.

1. Desert Rock Energy Project (DREP)-Red Mesa East (RME) 500 kV line.

A new 198 mile, 500 kV transmission line will be constructed between the new DREP 500 kV switching station to the new Red Mesa East 500 kV switching station. Conductor will be double-bundled 2156 kcm Bluebird and the line will be series compensated at the DREP switchyard. Tentative size of the series capacitor is 45 ohm (38% compensation) with a minimum rating of 2200 A continuous. In addition, the line will have two shunt reactors (one at each terminal) rated for 154 Mvar @ 500 kV which combined will provide 86% compensation for the line. Metering point for NTP 1 will be the DREP terminal.

2. RME 500 kV Switching Station.

The DREP-RME 500 kV line will terminate at a new 500 kV ring bus (RME) which will include a loop-in of the existing Navajo-Moenkopi 500 kV line. Location of the new switchyard is approximately 14 miles south of the Navajo Generation Station. No facilities at the Navajo switching station will be transferred to the RME site and no changes will be made to the compensation level of the Navajo-Moenkopi series capacitor.

3. Replacement of the Four Corners 525/345 kV transformer.

A new 1200 MVA, 525/345 kV (a minimum emergency rating of 1440 MVA) transformer will be installed either in parallel or as a replacement for the existing 840 MVA transformer at the Four Corners 525/345 kV switching station.

4. Upgrade of the Four Corners-Moenkopi Series Capacitor Bank.

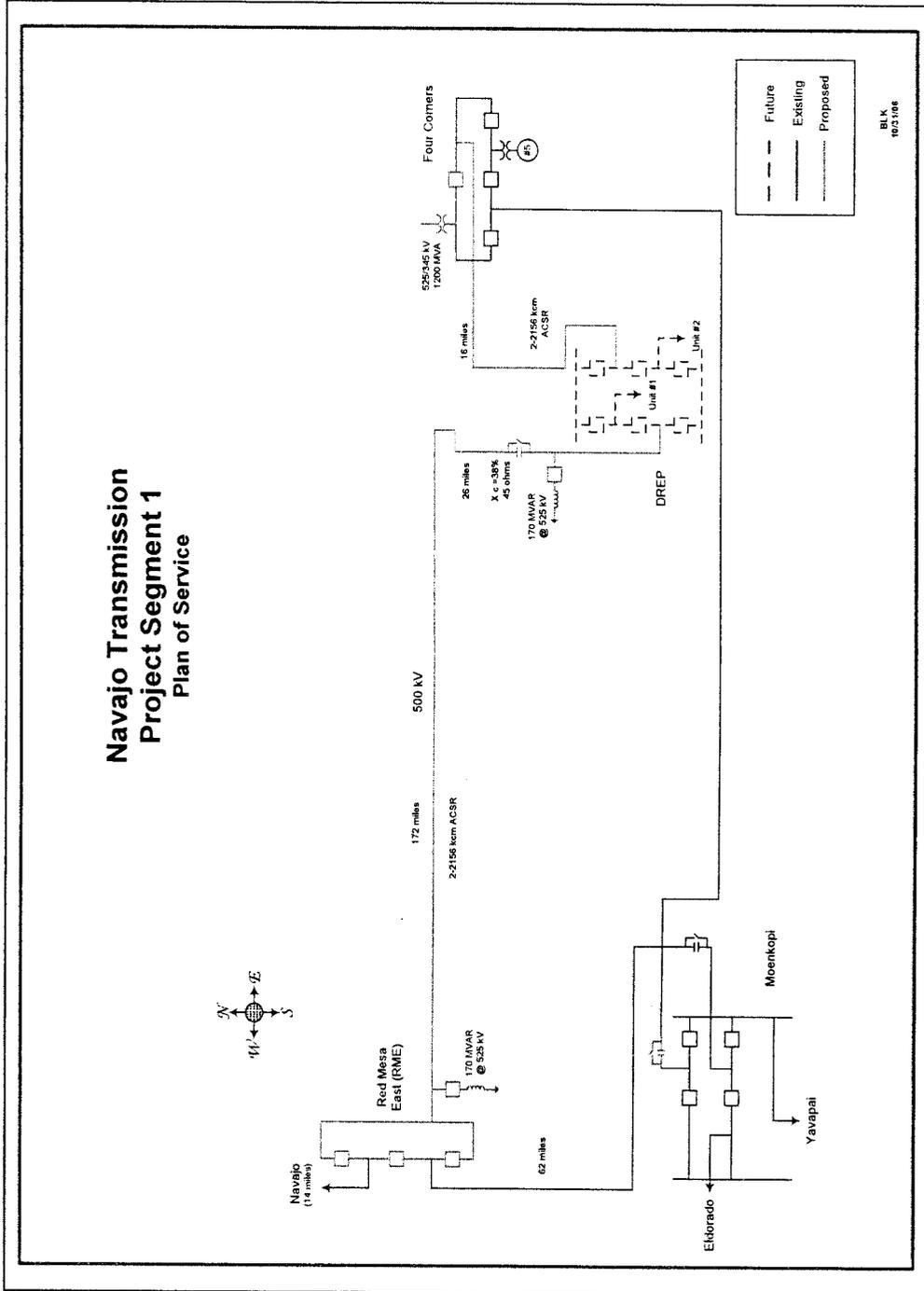
The present series capacitor bank in the Four Corners-Moenkopi 500 kV line at the Moenkopi terminal will have its continuous rating upgraded from 1810 A to 2200 A. and have an emergency rating of 2970 A. However, the compensation level (24%) for this bank will remain unchanged.

5. DREP-Four Corners 500 kV line.

A new 16 mile 500 kV transmission line will be constructed from the new DREP 500 kV switchyard to the existing Four Corners 500 kV switching station. Conductor will be double-bundled 2156 kcm Bluebird. As a result, a new 500 kV terminal will be added at the Four Corners site.

Study results show that the plan of service described above will support a 1600 MW non-simultaneous and simultaneous rating for NTP 1 without violating WECC/NERC Planning Standards or reliability criteria. However, the rating is contingent on the presence of the DREP generation being in-service. In addition, the present nomogram for

Figure 2

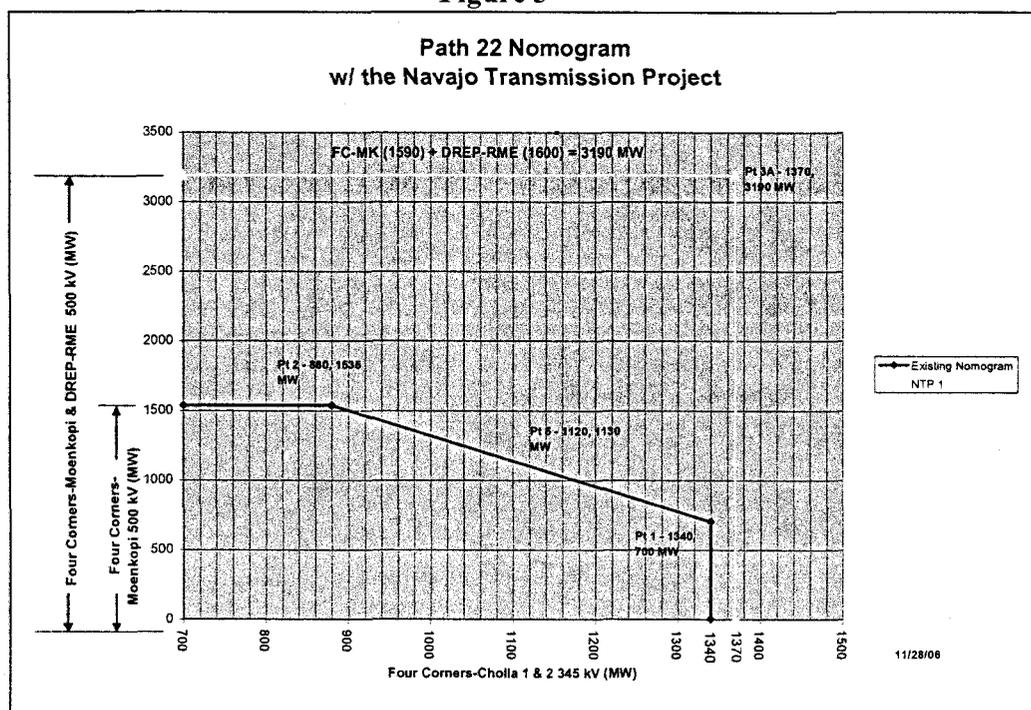


the Path 22 cutplane is recommended to be eliminated (for all lines in-service) as a result of the proposed plan of service. Also, the Operating Transfer Capability of the Four Corners-Moenkopi 500 kV line will increase from its current value of 1535 MW to 1590 MW. Path 23's rating from the 345 kV system to the 500 kV system will increase 840 MW to 1040 MW. Rating of Path 22 south of Four Corners will increase from 1340 MW to 1370 MW. Although the rating for the Four Corners-Moenkopi 500 kV will continue to be 1590 MW (as defined in the 2006 Path Rating Catalog), the new (i.e. two line) 500 kV path rating west of Four Corners will be 3190 MW.

The combination of the DREP-RME and Four Corners-Moenkopi 500 kV lines will become a separate WECC path as well as the Four Corners-Cholla #1 & #2 345 kV lines. No negative simultaneous impacts on other lines or paths were identified in the study analyses. For both the non-simultaneous and simultaneous limits, the critical contingency is the loss of the DREP-RME 500 kV line and the subsequent loading of the Four Corners-Moenkopi 500 kV line to its emergency rating. Figure 3 shows the current Path 22 nomogram and proposed improvement as a result of NTP 1. Results of the studies to date for NTP 1 support the following benefits to the system

- Elimination of the Path 22 nomogram.
- Increase of the OTC of the Four Corners-Moenkopi 500 kV line from 1535 MW to 1590 MW.
- Increase of the Path 23 rating from 840 MW to 1040 MW.
- Increase of the Four Corners-Cholla 345 kV rating from 1340 MW to 1370 MW.

Figure 3



A tentative list of milestones for the Navajo Transmission Project is given in Table 1.

Table 1

Activity	Anticipated Completion Date
Arizona CEC	ask for Extension; not yet Completed
Reissued ROD	Revised by BLM Q1 2007;
BIA ROW Approval	Prudery for " BIA Q3 2007
Rating Studies	Q4 2007 ✓
Commercial Operation	Postponed due to delay of DR Q3 2010

II. Introduction

In the early 1990s, Western Area Power Administration (WAPA) began WSCC rating studies on the Navajo Transmission Project (NTP) that originated from the Four Corners area and ultimately terminated at the Marketplace switching station. Although WAPA achieved an accepted rating for the project in 1997, the project's in-service date was subsequently delayed until 2002. WAPA approved a Final Environmental Impact Statement (FEIS) for the NTP in a Record of Decision (ROD) that was issued in October 1997. Because the lead federal agency role was subsequently assigned to the US Bureau of Land Management (BLM), the BLM is reissuing the ROD. After the ROD was issued in 1997, DPA undertook activities to develop the NTP, including efforts to complete segment 1. This request analyzes that portion of segment 1 of the NTP, referred to as NTP 1, which originates from the Four Corners 500 kV switching station and terminates at the new RME switchyard south of the Navajo Generation Station. Consequently, DPA has elected to re-enter the Project Rating Review process to obtain a new rating for NTP 1.

DPA has proposed to build their new 500 kV project to achieve the purposes and needs of the NTP as set forth in the FEIS and ROD. These purposes include, but are not limited to, facilitation the development of Navajo Nation energy resources, improving economic conditions on the Navajo Nation, and facilitating the Navajo Nation's participation in the electric utility industry. Constructing the NTP 1 with the proposed path rating described in this report will, in part, help the Navajo Nation fulfill these purposes by facilitating DPA's participation in a new two-unit coal fired generating plant that is to be built southwest of the Four Corners Generation Station. Maximum net capacity of the new plant is 1400 MW. Flows on NTP 1 will primarily be from the new project but will not exclusively be limited to output from the plant. The proposed plan of service for NTP 1 is given in Figure 2 and the major components of the project are listed in the Executive Summary of this report. Currently, the in-service for NTP 1 is summer 2010.

Because of its proximity to Path 22 and Path 23, the analyses performed in this study stressed both non-simultaneous and simultaneous impacts of NTP 1 on the existing system. Path 22 is presently defined as the combined flows on the Four Corners-Moenkopi 500 kV and Four Corners-Cholla #1 & #2 345 kV lines. Path 23 is defined to be the Four Corners 525/345 kV transformer. Metering points for Path 22 components are located at their respective Four Corners' terminals. Path 23's metering point is the 345 kV winding. Metering point for NTP 1 is the DREP terminal of the DREP-RME 500 kV line.

Figure 2 shows a slightly modified plan of service for NTP 1 relative to the description provided to WECC members in the March 10, 2006 notification letter. In the notification letter, an additional switching station (Four Corners West) was included and the DREP switchyard was configured as a ring bus.

III. Study Assumptions

Study Cases

A WECC 2010 summer case (2010HS1A) was modified to represent the heavy summer time frame for the New Mexico Eastern Arizona areas. Three pre-project cases were built modeling the current Path 22 nomogram simultaneous operating points. One post-project case was constructed representing the maximum simultaneous limits with the addition of NTP 1 to Path 22. Power flow and transient stability analyses were performed on these four cases. Reactive margin analyses were performed on eight cases built from these original four cases.

Sensitivity cases were built to assess any simultaneous interactions between NTP 1 and the Southern Navajo (Path 51) Upgrade Project. Upgrades to Path 51 are currently underway and are expected to be complete by 2010. This project is also currently progressing through the WECC Project Ratings Review process and is viewed as being similarly situated with NTP 1. One pre- and one post-project case were constructed with Path 51 at 3100 MW. Power flow and transient stability analyses were conducted on these cases. Four additional cases were constructed from the initial two to assess post-transient effects.

Two other cases were built to assess performance of the Navajo 7% Generation Margin criterion. Again, these two cases represent pre- and post-NTP 1 scenarios. Only transient stability analyses were performed on these cases. Table 2 shows the cases and flow levels compiled for the CPR study. As can be seen, a total of twenty cases were constructed for the NTP 1 Comprehensive Progress Report.

Table 2

Cases	Analysis	NTP	Path 51	Path 50	Four C-Moenkopi	Four C-Cholla 1&2	Navajo-Crystal	Path 23	FCCS	NGS	DREP
ntp 006c	PF,TS	-	-772	756	1535	850	1028		2060	0	-

CUS/S	Analysis	NTP	Path 51	Path 50	Force- magnets	Force- Chatter #2	Force- Crystal	Path 23	FCGS	NIGS	DREP
ntp_006c2	PT	-	-795	765	1575	866	1011		2140	0	-
ntp_006c5	PT	-	-760	782	1615	901	995		2260	0	-
ntp_012b	PF,TS	-	1484	805	1152	1089	980		2060	2240	-
ntp_012b2	PT	-	1508	821	1185	1121	983		2160	2240	-
ntp_012b5	PT	-	1533	836	1213	1153	983		2260	2240	-
ntp_018c	PF,TS	-	2116	416	682	1340	459		2060	2170	-
ntp_018c2	PT	-	2135	434	713	1374	463		2160	2170	-
ntp_018c5	PT	-	2155	450	743	1407	466		2260	2170	-
ntp_006e	PF,TS	1611	594	807	1579	1373	1170	1041	2065	155	1400
ntp_006e2	PT										
ntp_006e5	PT										
ntp_012g	PF,TS	-	3100	851	853	1242	36		2060	2240	-
ntp_012g2	PT	-	3177	854	838	1250	74		2060	2390	-
ntp_012g5	PT	-	3263	856	826	1256	117		2060	2556	-
ntp_012h	PF,TS	1022	3100	872	1007	1299	566		2060	2240	1400
ntp_012h2	PT	1011	3191	877	1000	1311	603		2060	2406	1400
ntp_012h5	PT	1000	3271	880	992	1320	638		2060	2556	1400
ntp_012gm	TS	-	3161	853	841	1248	93		2060	2410	-
ntp_012hm	TS	1014	3160	877	1003	1307	623		2060	2410	1400

All of the analyses were performed using the GE power flow/transient stability program PSLF v15.2 under a Windows NT platform. Various power flow, transient stability and reactive margin routines were also used to perform the assessments.

Case Assumptions

As was mentioned before, a summer case representing a 2010 time frame was chosen for the CPR study. In addition to the upgrade to Path 51, other projects in the eastern Arizona area were modeled in all of the study cases. These projects include but are not limited to the Springerville Unit #3 and #4 additions, the Raceway-Pinnacle Peak 500 kV line, the TS5-Raceway 500 kV line and Palo Verde-TS5 500 kV project.

For the post-project cases, the data to model the major project components listed in the executive summary was included. Additionally, the data to model the Desert Rock Energy Project was added to the post-project cases. Table 3 lists the relevant projects included in the study cases.

Table 3

Project	Location	In-service Date	Capacity/Net Output
P. West-Santa R. 500 kV	PV East	Summer 2008	-
Palo Verde-TS5 500 kV	PV East	Summer 2009	-
Springerville Unit #4	SGS	Winter 09/10	430 MW
Southern Navajo Upgrade	Path 51	Summer 2010	3100 MW
Desert Rock EP	FCGS	Summer 2010	1400 MW
Raceway-Pin. Peak 500 kV	Phoenix	Summer 2010	-

IV. Study Criteria

For the NTP 1 Comprehensive Progress Report, the WECC/NERC Planning Standards were used to assess of the performance of the study results. These standards can be found in part I of the document "WECC Reliability Criteria" and were used during the power flow, transient stability and post-transient analyses. In addition, the document "NTP 1 Comprehensive Progress Report Study Scope" was also used to provide guidance and a methodology to the study process.

For the reactive margin analyses, APS currently does not have reactive margin requirements or criteria for assessing its transmission system. In lieu of internal criteria, APS uses WECC standards S1-S4 for assessing voltage stability of its system. Consequently, the document "Guide to WECC/NERC Planning Standards I.D: Voltage Support and Reactive Power" was used as a reference to performing voltage stability analysis.

V. Study Results

Power flow Results

Heavy summer, upper corner point pre-project (ntp_006c) –

Power flow results for the pre-project upper corner point case showed no violations of planning standards or reliability criteria for the 2010 heavy summer scenario. There were no limiting conditions for this case and the 1535 MW OTC limit for the Four Corners-Moenkopi 500 kV line was reaffirmed. Shown below is the listing of the more significant outages for this case.

- As a result of an outage of the Four Corners-Moenkopi 500 kV line, the Four Corners-Cholla #1 345 kV line loads to 1284 amps or 84% of its emergency rating and the COCONINO 230 kV bus dips to 4.04%.
- An N-2 outage of the Four Corners 525/345 kV transformer and the Four Corners-Moenkopi 500 kV line caused the Four Corners-Cholla #1 345 kV line to load to 981 amps or 64% of its emergency rating.

A full review of the other outages taken revealed no further significant overload or voltage events. Table A in Appendix A provides a more detailed summary of the assessment of ntp_006c.

Heavy summer, mid-point pre-project (ntp_012b) –

Analysis of the mid-point pre-project case demonstrated no violations of WECC/NERC Planning Standards or reliability criteria. Like the upper corner point case, there were no

limiting contingencies for this planning scenario. A few of the more limiting disturbances is given below.

- Loss of both Four Corners-Moenkopi 500 kV line and the Four Corners transformer (breaker failure) resulted in the Four Corners-Cholla #1 345 kV line loading to 1363 amps or 90% of its emergency rating.
- As with the corner point case, the Four Corners-Cholla #1 345 kV line loaded to 1357 amps with the loss of the Four Corners-Moenkopi 500 kV line.

Table B in Appendix A contains a more thorough listing of the outages for the mid-point case.

Heavy summer, bottom corner point pre-project (ntp_018c) –

Unlike the other nomogram limits, the bottom corner point is limited by an outage of the Four Corners-Cholla #2 contingency. However, no violations of WECC/NERC Planning Standards or reliability criteria were found for the analysis of the ntp_018c case. Some of the more severe outages are provided below.

- Loss of the Four Corners-Moenkopi line caused the Four Corners-Cholla #1 345 kV line to load to 1327 amps or 87% of its emergency rating.
- A double element outage of the Four Corners 525/345 kV transformer and the Four Corners-Moenkopi 500 kV line due to a breaker failure event caused the Four Corners-Cholla #1 line to load to 88% of its post-disturbance rating.

There were no voltage violations for these or any of the other outages studied for the bottom corner point case. A summary of the more restrictive contingencies is found in Table C of Appendix A.

Heavy summer post-project (ntp_006e) –

With the addition of the NTP 1 project, the post-project case (ntp_006e) was constructed modeling simultaneous flows on the Four Corners-Cholla #1 & #2 and both 500 kV lines west of Four Corners. Power flow results show no violations to WECC/NERC Planning Standards or reliability criteria. However, the limiting contingency for the 500 kV path west of Four Corners was loss of the proposed DREP-RME 500 kV line with the subsequent loading of the Four Corners-Moenkopi 500 kV line to 99% of its emergency rating. Alternately, the limiting contingency for the 345 kV path south of Four Corners was loss of the Four Corners-Cholla #2 line which loads the Four Corners-Cholla #1 345 kV line to 100% of its emergency rating. Below is a listing of the most limiting outages for this case.

- Loss of the 525/345 kV transformer at Four Corners switching station caused the Four Corners-Cholla #1 345 kV line to load to 1489 amps or 98% of its emergency rating.
- The Four Corners-Cholla #1 345 kV line loaded to 1434 amps for a breaker failure outage of both Moenkopi-Yavapai and Four Corners-Moenkopi 500 kV lines.
- An outage of the Four Corners-Moenkopi 500 kV line loaded the Four Corners-Cholla #1 345 line to 93% of its emergency rating.
- Loss of Four Corners-Cholla #2 loads the Four Corners-Cholla #1 345 kV line to 100% of its emergency rating.

No voltage violations were found for any of the contingencies studied and did not limit the ratings being proposed. A more complete list of outages can be found in Appendix A for this scenario.

Path 51 sensitivity heavy summer (ntp_012g and ntp_012h) –

For the proposed upgrade of Path 51, two power flow cases were built and analyzed to determine whether the addition of the NTP 1 project caused any adverse impacts to the project. Results for the pre-project case (ntp_012g) show no contingencies were found that violated WECC/NERC Planning Standards or reliability criterion. However, the three most critical outages are provided below.

- Loss of the Four Corners-Moenkopi 500 kV line resulted in the Four Corners-Cholla #1 345 kV line loading to 91% of its emergency line rating.
- The Navajo-Ormes series capacitors loaded to 2201 A of their proposed rating of 2362 A for loss of Moenkopi-Yavapai 500 kV line.
- An N-2 outage of both the Moenkopi-Four Corners and the Moenkopi-Yavapai 500 kV lines (breaker failure) caused the Four Corners-Cholla #1 line to load to 93% of its emergency rating.

Results from the power flow assessment show that the proposed rating of the Southern Navajo upgrade project is not adversely impacted as a result of the project. No planning standards or reliability criterion were found to be violated with the addition of the NTP 1 project with Path 51 at its proposed new rating. A list of the more limiting contingencies follows.

- Loss of the Moenkopi-Yavapai 500 kV line causes the Navajo-Ormes series capacitors to load to 94% of their proposed emergency rating.

- The Moenkopi-RME 500 kV series capacitors load to 2298 A or 90.5% of its emergency rating for an outage of the Navajo-Orme 500 kV line.
- A breaker failure outage of both the Four Corners transformer and Four Corners-Moenkopi 500 kV line causes the Moenkopi-RME series capacitor to load to 98% of its emergency rating.

No other disturbances were found to violate any existing line or facility ratings for either the pre- or post-NTP 1 cases. Additionally, no voltage violations were found as a result of the NTP 1 project operating with Path 51 at maximum flows. A summary listing of the outages for cases ntp_012g and ntp_012h can be found in Appendix A.

Transient Stability Results

Heavy summer, upper corner point pre-project (ntp_006c) –

Analysis of the upper corner point pre-NTP 1 case revealed no WECC/NERC violations for the 2010 time frame. Flow on the Four Corners-Moenkopi 500 kV line was 1535 MW and the case was just within the existing operating nomogram. Results of the most critical contingencies for this case are given below.

- A three phase fault on the Four Corners 500 kV bus and loss of the 525/345 kV transformer at Four Corners caused the frequency to dip to 59.61 Hz on the Unit #5 22 kV bus.
- Loss of the Westwing-Yavapai 500 kV line due to a fault on the Westwing 500 kV bus forced the frequency on the SUN G1 13.8 kV bus to drop to 59.88 Hz.

None of the disturbances simulated exhibited negative damping for the ntp_006c case. A summary of the disturbance results are given in Table A in Appendix B.

Heavy summer, mid-point pre-project (ntp_012b) –

For the pre-project mid-corner point case, the transient stability results showed no violations of WECC/NERC Planning Standards or reliability criteria for the Four Corners area in the 2010 time frame and the operating conditions modeled. Listed below are the most limiting contingencies for this scenario.

- Frequency on the RANVIST2 13.8 kV bus dipped to 59.65 Hz as a result of a three phase fault on the CHOLLA 500 kV bus and loss of the Cholla-Saguaro 500 kV line. Voltage on the VAIL2 345 kV bus dipped 11.7% due to the disturbance.
- A three phase fault on the FOURCORN 345 kV bus and loss of the Four Corners-Cholla #2 345 kV line caused a 15.6% voltage dip on the MORIARTY 69 kV bus and the frequency to dip to 59.41 Hz on the FT_MARCY 12.5 kV bus.

- Loss of the Navajo-Moenkopi 500 kV line due to a three phase fault on the NAVAJO 500 kV bus caused the frequency on the NAVAJO 1 26 kV bus to dip to 59.65 Hz.

Positive damping was found on all simulation plots for the ntp_012b case. A summary of the worst contingency results can be seen in Appendix B.

Heavy summer, bottom corner point pre-project (ntp_018c) –

Transient stability simulations of the bottom corner point of the Path 22 nomogram revealed no violations of WECC/NERC Planning Standards. No limitations were found in the analyses for the pre-project case and a brief list of the more significant contingencies is given below.

- An outage of the Four Corners-Cholla #2 345 kV forced the voltage at the MORIARTY 69 kV bus to .82 pu and the frequency at the FT_MARCY 12.5 kV bus to 59.29 Hz for a three phase fault on the FOURCORN 345 kV bus.
- Loss of the Four Corners 525/345 kV transformer resulted in the frequency on the FCNGN5CC 22 kV bus dropping to 59.67 Hz.

A review of the stability plots for the ntp_018c case showed all disturbances resulted in positive damping and no violations of either WECC or MORC criteria. A summary listing of the outages simulated for the bottom corner point case can be found in Table C of Appendix B.

Heavy summer post-project (ntp_006e) –

Results from the transient stability simulations for the post-project corner point case show no violations of WECC or MORC reliability criteria for voltage or frequency performance. Consequently, the analyses show a rating of 1550 MW is obtainable with the proposed plan of service and there are no simultaneous interactions between NTP 1 and other adjacent paths. Below are the most critical outages for this scenario.

- A three phase fault on the FOURCORN 500 kV bus and loss of the Four Corners-Moenkopi 500 kV circuit resulted in the frequency on the EL_VAD01 4.16 kV bus dropping to 59.71 Hz.
- Loss of the Four Corners-DREP 500 kV due to a fault on the FOURCORN 500 kV bus forced the voltage to dip to .85 pu and the frequency to drop to 59.60 Hz on the DREP G1 24 kV bus.
- An outage of the Four Corners-Cholla #2 345 kV forced the voltage at the CLAPHAM 115 kV bus to .89 pu and the frequency at the FT_MARCY 12.5 kV bus to 59.55 Hz for a three phase fault on the FOURCORN 345 kV bus.

As with the pre-project cases, all of the post NTP 1 case disturbance simulations revealed positive damping for all outages. A summary of the outage results are given in Appendix B.

Path 51 sensitivity heavy summer (ntp_012g and ntp_012h) –

Simulation results for the Path 51 upgrade project at maximum output (3100 MW) shows that the anticipated system for 2010 without NTP 1 (ntp_012g) will not violate WECC/NERC Planning Standards. Listed below are some of the more limiting outages found in the analysis.

- A 3-phase fault on the Cholla 500 kV bus and loss of the Cholla-Saguaro 500 kV line results in a frequency dip to 59.62 Hz on the RANVIST2 13.8 kV bus and a minimum voltage of .85 pu on the VAIL2 345 kV bus.
- Loss of the Coronado-Silver King 500 kV due to a fault on the Coronado 500 kV caused the voltage on the VAIL2 345 kV bus to dip to .87 pu.
- An outage of both Four Corners-Moenkopi and Moenkopi-Yavapai 500 kV lines due to a single-line fault and a breaker failure operation resulted in the voltage on the LEUPP 230 kV bus to drop to .88 pu.

All disturbances associated with the ntp_012g case resulted in positive damping.

With the addition of the NTP 1 project to the Path 51 upgrade project, the study results demonstrate that the plan of service proposed for NTP 1 does not violate WECC/NERC Planning Standards for N-1 or N-2 disturbances. Given below are the most significant disturbances for the ntp_012h case.

- Loss of the new Four Corners 525/345 kV transformer for three phase fault on the Four Corners 500 kV bus caused the frequency to dip to 59.63 Hz.
- A single-line to ground fault on the Four Corners 500 kV bus and subsequent loss of the Four Corners 525/345 kV transformer and Four Corners-Moenkopi 500 kV line (breaker failure) caused the frequency on the DREP G1 24 kV bus to drop to 59.65 Hz.
- An outage of the Coronado-Silver King 500 kV line due to a three phase fault on the Coronado 500 kV bus caused the bus voltage on VAIL2 345 kV bus to drop to .85 pu.

Plots of outage simulations for the ntp_012h case revealed positive damping for all disturbances. Summary results for both the pre- and post-project cases are found in Appendix B.

Path 51 sensitivity heavy summer generation margin (ntp_012gm and ntp_012hm) –

As described earlier, two cases for assessing the generation margin criterion for the Navajo plant were built for the Path 51 upgrade sensitivity. Transient stability results for the pre-NTP 1 (ntp_012gm) scenario showed that no violations to WECC/NERC Planning Standards. Below are the two most critical contingencies studied for the ntp_012gm case.

- A single-line-to-ground fault and a breaker failure operation resulting in a loss of the Four Corners 525/345 kV transformer and the Four Corners-Moenkopi 500 kV line forced the voltage at the LEUPP 230 kV bus to dip to .87 pu.
- Loss of the Navajo-Moenkopi 500 kV line due to a three-phase fault at Moenkopi resulted in a frequency dip on the Navajo 1 26 kV bus to 59.60 Hz.

A review of all the simulation plots for ntp_012gm showed positive damping.

Post-NTP 1 performance under Navajo generation margin conditions also demonstrated no violations of WECC Reliability Criteria with the Path 51 upgrade in service. Results of the transient stability simulations reaffirm the plan of service for the NTP 1 project. The more critical disturbances from the analyses are found below.

- Loss of the Four Corners 525/345 kV transformer due to a three phase fault on the Four Corners 500 kV bus allowed the frequency at the Four Corners unit #5 bus to dip to 59.63 Hz.
- A breaker failure operation due to a single-line-to-ground fault resulted in a loss of the Four Corners 525/345 kV transformer and the Four Corners-Moenkopi 500 kV. The bus frequency at DREP G1 24 dropped to 59.65 Hz.

All simulation plots exhibited positive damping and a summary of the stability results for both cases can be found in Appendix B.

Post-transient/reactive margin Results

Heavy summer pre- and post-project (006c5/2, 012b5/2 & 018c5/2, & ntp_006e5/2) –

Reactive margin results from the post-project corner point were compared with the three pre-project cases and demonstrated no violations according to WECC standards S1-S4. Both N-1 and credible N-2 contingencies were taken against Path 22 at 105% and 102.5% of rated flows from their respective base cases. The listing below gives a comparison between the pre-project and the post-project cases for certain disturbances.

- Loss of the Four Corners 525/345 kV transformer produced an increase of 366 Mvar on the SILVERKG 230 kV bus between the post-project and mid-point case.

- Reactive capability dropped from 591 Mvar in the upper corner point pre-project case to 457 Mvar in the ntp_006f5 case for a N-2 loss of the Four Corners-Moenkopi and Moenkopi-Yavapai 500 kV lines.
- Reactive margin on the COCONINO 230 kV bus remained essentially unchanged between the post-project and all of the pre-project cases studied, including N-1 and N-2 outages.

A summary of the results of the eight cases assessed in the reactive margin analyses are given in Tables A-D of Appendix C.

Path 51 sensitivity heavy summer (ntp_012g5/2 and ntp_012h5/2) –

Results from the Path 51 sensitivity reactive margin analysis revealed that no violations in either the pre- and post-NTP 1 cases with regards to WECC standards S1-S4. Five primary buses were monitored and include COCONINO 230 kV, YAVAPAI 230 kV and CHOLLA 230 kV. For the N-1 contingencies, flows on Path 51 were adjusted to 105% of the anticipated rating and for N-2 outages flows were adjusted to 102.5% of the expected new rating. Overall, reactive margin increased on all the primary buses except for Coconino 230 kV. Some of the more dramatic results are seen below.

- Outage of the Moenkopi-Yavapai 500 kV caused the reactive margin to increase 475 Mvar on the PNPKAPS 230 kV bus between the pre- and post-project cases.
- Loss of the Four Corners 525/345 kV transformer and the Four Corners-Moenkopi 500 kV line resulted in a 12% drop in reactive reserve on the COCONINO bus.
- The reactive margin on the SILVERKG 230 kV bus increased 181 Mvar from the pre- to the post-NTP 1 cases.

A summary of the results for the ntp_012g5/2 and ntp_012h5/2 cases can be found in Appendix C.

VI. Conclusions

Results of the power flow, reactive margin and transient stability results demonstrate that the plan of service for the NTP 1 (see Figure 2) will support a simultaneous and non-simultaneous rating of 1600 MW without violating either WECC/NERC Planning Standards or WECC Reliability Criteria. OTC on the Four Corners-Moenkopi 500 kV line will increase by 55 MW and the Path 22 nomogram will be eliminated. No ratings for paths adjacent to the project are negatively impacted as a result of NTP 1 operating at its proposed rating.

Point of contact for questions or comments regarding this report and future studies is given below:

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Appendix A
Power Flow Results

Appendix B
Transient Stability Results

Appendix C
Reactive Margin Results

WECC Regional Planning Project Review Report

Navajo Transmission Project Segment 1 (NTP 1)

DRAFT
Rev. 2

February 1, 2007

Dine Power Authority,

Sithe Global, LLC,

and

NTP 1 Regional Planning Project Review Group

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APPENDICES

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Appendix B	Project Rating Review Announcement Letter dated March 10, 2006
Appendix C	Regional Planning Project Review Group Participants
Appendix D	NTP 1 RPPR Group January 24, 2007 meeting minutes
Appendix E	NTP 1 Comprehensive Progress Report w/o Appendices

1. Project Background

In July 1992, Western Area Power Administration (WAPA) began Western Systems Coordinating Council (WSCC) rating studies for the Navajo Transmission Project (NTP). At the time, the NTP originated from a proposed Shiprock 500 kV switching station and terminated at the Marketplace switchyard. Working with a review group, WAPA achieved an accepted rating for this project in January 1997. In addition, WAPA also participated in a regional planning process for the NTP. In 1997 however, WAPA announced that the project in-service date was delayed until 2002. The U.S. Department of Interior, Bureau of Land Management (BLM) took over after 2002 as lead federal agency for the NTP.

Dine Power Authority, the Navajo Nation project sponsor, is pursuing completion of the project in three segments in accordance with the Final Environmental Impact Statement (FEIS) and the Certificate of Environmental Capatibility (CEC) issued in 2000 from the Arizona Corporation Commission. The first segment of the NTP is referred to as the Navajo Transmission Project Segment 1 (NTP 1). NTP 1 will start from the Four Corners 500 kV switching station and terminate at a new 500 kV switchyard called Red Mesa East (RME). At RME, the existing Navajo-Moenkopi 500 kV transmission will loop into the new station approximately 14 miles south of the Navajo Generating Station. Due to changes in system configuration and the differences in the scope of between NTP and NTP 1, Dine Power Authority (DPA) has decided to enter both Western Electricity Coordinating Council (WECC) regional planning and rating processes again.

2. Purpose of the Compliance Report

DPA initiated on March 14, 2006 (Appendix A) the WECC Regional Planning Project Review process for the proposed Navajo Transmission Project Segment 1 (NTP 1). DPA proposes a non-simultaneous rating for the project of 1600 MW and a tentative in-service date of summer 2010. In addition, DPA has started the WECC Project Rating Review process (Appendix B) for obtaining an accepted rating for the NTP 1. To assist in advancing its project through both processes, DPA has contracted with Arizona Public Service (APS) to perform the bulk of the study work. DPA is also working with Sithe Global, LLC (Sithe Global) to develop the Desert Rock Energy Project (DREP). DREP is a proposed 1400 MW coal plant that is being developed southwest of the Four Corners 500 kV switching station. In-service date for DREP is scheduled for the summer of 2010.

As a requirement to satisfy the WECC Regional Planning Project Review process, the sponsors of NTP 1 are developing this compliance report as a component of completing the process. Additionally, DPA is completing this report as part of the requirements of the WECC Project Rating Review process for obtaining an accepted rating for the project.

As part of the regional planning process, DPA has also formed a Regional Planning Project (RPPR) Review Group (RPRG) to help in completing this report and completing other tasks associated with the RPPR process. DPA's request to form a review group was made at the

onset of initiating the Regional Planning Process and a list of members participating in the review group is given in Appendix C.

3. Proposed Plan of Service

Using study results performed to date, the plan of service for the NTP 1 (see Figure 1) will support a 1600 MW non-simultaneous/simultaneous rating and its major components are listed below. As well as other system changes, the new DREP facilities are shown below and are required for NTP 1 to achieve its proposed rating.

- Construct a new 500 kV switching station (RME) south of the existing Navajo Generating Station and fold-in the Navajo-Moenkopi 500 kV line.
- Build 198 miles of 500 kV, 2-2156 kcm series-compensated transmission line from the RME to DREP switching stations. Add switched reactors at both RME and DREP switchyards.
- Construct a new 500 kV switching station (i.e. DREP) southwest of the existing Four Corners switchyard at the site of the DREP.
- Build approximately 16 miles of 500 kV, 2-2156 kcm transmission line from the DREP switching station to the existing Four Corners 500 kV switchyard.
- Add a new 500 kV terminal position at the Four Corners 500 kV switching station.
- Replace the existing 500/345 kV, 840 MVA Four Corners transformer with a new 1200 MVA unit.
- Upgrade the Four Corners-Moenkopi series capacitor at Moenkopi switchyard to 2200/2970 A.

Current and on-going study efforts will continue to refine certain aspects of the plan of service for NTP 1. It is anticipated that the design will be finalized prior to issuing the WECC Accepted Ratings Report.

4. Compliance with the WECC Regional Planning Guidelines

This section provides information in response to each of the WECC Regional Planning Process Guidelines with regards to NTP 1. WECC guidelines are presented in bold italic font and responses are provided in normal font.

- 4a) *Take multiple project needs and plans into account, including identified utilities' and non-utilities' future needs, environmental and other stakeholder interests.*

As currently planned, the NTP 1 does not conflict or prevent other utilities from pursuing their own transmission or generation facilities in the eastern Arizona and Four Corners areas. Other projects that are found in these areas include but are not limited to the Springerville Unit #4 Project, the Southern Navajo Upgrade Project and the Rio Puerco Project.

DPA is planning to use the existing corridor that was permitted in the 1990's for the original Navajo Transmission Project. This corridor was left unused since the original planning effort ended in the late 1990's. New rights of way will be acquired for approximately 25 miles from the Desert Rock plant site to connect with the Navajo Transmission Project corridor. WAPA approved the FEIS for the NTP in a Record of Decision (ROD) which was issued in October 1997. The Navajo Nation granted the NTP rights of way across the reservation to DPA in 2003. BLM was subsequently assigned as the lead federal agency for the project and is expected to reissue the ROD in the first quarter of 2007. In the third quarter of 2007, the Bureau of Indian Affairs is expected to approve the ROW for the NTP 1.

On March 15, 2006, the WECC Regional Planning Project Review process was begun with a solicitation of interest in forming a Project Review Group. Prior to this request, presentations were made by Sithe Global, DPA and APS to the Technical Studies Subcommittee, the SWAT-AZNM Technical Work Group, the Navajo Engineering and Operations Committee and WATS Committee. At the January 24 meeting of the Project Review Group, members were asked if there were other local needs or interests that could be addressed by the scope of the NTP 1.

4b) *Cooperate with others to look beyond specific end points of the sponsors' project to identify broader regional and sub-regional needs or opportunities.*

As mentioned before, DPA is coordinating its efforts with Sithe Global and all interested parties to address sub-regional needs and opportunities in the Four Corners area. In addition, DPA, Sithe Global and APS have announced both the NTP 1 and the Desert Rock projects regionally and sub-regionally in many venues (see response to 4a) to solicit comments and answer questions. To reach a greater regional audience, DPA has initiated the WECC Regional Planning Project Review process as well as the Project Rating Review process. Both of these processes are intended to enlist interest outside of the Desert Southwest region in a structured and comprehensive manner.

4c) *Address the efficient use of transmission corridors (e.g. rights-of-way, new projects, optimal line voltage, upgrades, etc.)*

NTP 1 will utilize the existing corridor of the Navajo Transmission Project that was studied in the 1990's. A final EIS was issued in 1997 for the original corridor and the CEC was issued by the State of Arizona in 2000. As was mentioned earlier, approximately 25 miles of new rights-of-way (ROW) will be required from the Desert Rock plant to link with the NTP corridor. All of the new ROW will be located on Navajo Nation land.

4d) *Identify and show how the project improves efficient use of, or impacts existing and planned resources of the region (e.g. benefits and impacts, transmission constraint mitigation).*

NTP1 will increase local transfer capability and access to planned resources regionally and sub-regionally. Specifically, NTP 1 benefits include:

- Increase the OTC on the Four Corners-Moenkopi 500 kV line from 1535 MW to 1590 MW.
- Provide firm access to the planned 1400 MW Desert Rock Energy Project.
- Increase the Path 23 (Four Corners 500/345 kV) rating from 840 MW to 1040 MW.
- Increase the Four Corners-Cholla 345 kV rating from 1340 MW to 1370 MW.
- Eliminate the Path 22 nomogram, and thus curtailments on Path 22 flows.
- Provide access to potential renewable resources north and east of the Four Corners area as well as the areas adjacent to the projects origination and termination points.

4e) *Cooperate with Regional Planning Review Group members in determining the benefits and impacts due to the project.*

As mentioned earlier, DPA initiated the Regional Planning Project Review process through WECC in part to meet guidelines for soliciting interest from other group members interested in the project. As part of WECC's guidelines DPA requested interest in forming a review group from WECC members, which subsequently occurred. DPA held its compliance meeting with RPPR group members on January 24, 2007 to directly assess interest in the project and collect comments from review group members. Comments and suggestions from DPA's RPPR group members were incorporated into the RPPR compliance report which will be sent to WECC's Planning Coordination Committee and Technical Studies Subcommittee. Some RPPR group members are expected to continue to be involved in the project during Project Rating Review process.

4f) *Identify transmission physical and operational constraints resulting from the project or that are removed by the project.*

Studies to date have shown no negative incremental impacts as a result of the project. However, studies have shown significant benefits due to the addition of the NTP 1 at and beyond the Four Corners area (see response to 4d). A question was raised regarding the by-passing of the existing Moenkopi series capacitor and its potential effects on the proposed rating for Path 22A. During the meeting the project sponsors indicated they will examine this effect in the phase II studies. Another question was asked if NTP 1 could be evaluated against the proposed upgrade to Path 49. The sponsors responded that NTP 1 or Path 22A will be assessed against the proposed upgrade to Path 49 to the extent the proposed Path 49 rating was assessed with the existing Four Corners-Moenkopi transfer capability.

4g) *Coordinate project plans with and seek input from all interested members, sub-regional planning groups, power pools, and region-wide planning group(s).*

See responses to 4a, 4b and 4e.

- 4h) *Coordinate project plans with and seek input from other stakeholders including utilities, independent power producers, environmental and land use groups, regulators, and other stakeholders that may have an interest.***

By participating in both the WECC Regional Planning Project Review and Project Rating Review processes, DPA has encouraged utilities, independent power producers and regulators who are WECC members to provide their input to the project. Both these forums provide input on a regional level. Presentations made to groups such as SWAT and STEP provide others who are not WECC members a chance to comment regarding NTP 1.

Outside of WECC, DPA has gone through several licensing processes where public comment is available to those who are interested (e.g. the State of Arizona Power Plant and Transmission Line Siting Committee). Until the project enters service, NTP 1 will continue to be under review as part of the WECC Project Rating Review process as well as other licensing, regulatory and permitting agencies.

- 4i) *Review the possibility of using the existing system, upgrades or reasonable alternatives to the project to meet the need (including non-transmission alternatives where appropriate).***

There are no other facilities in parallel to NTP 1 that can be used to accommodate the increase in transfer levels that DPA is proposing. Currently the only existing path between the Four Corners area and the northern Arizona transmission system is the Four Corners-Moenkopi 500 kV line and has a non-simultaneous operating transfer limit of 1535 MW and a rating of 1590 MW. However, to increase this path to accommodate another 1400 MW of generation would require another 500 kV circuit and other supporting facilities which is what the sponsors are proposing to build.

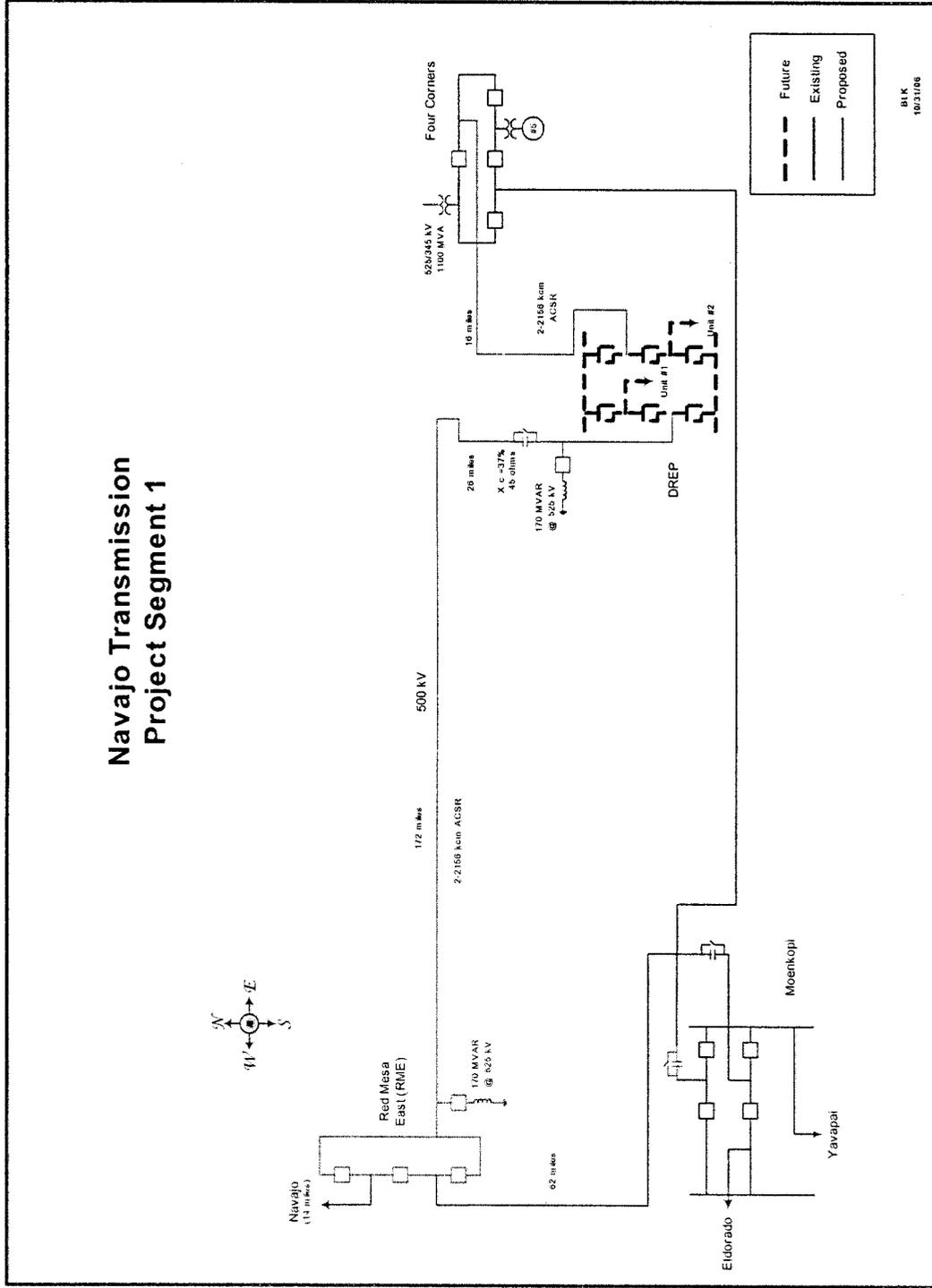
- 4j) *Indicate that the sponsor's evaluation of the project has taken into account costs and benefits of the project compared with reasonable alternatives.***

Early in their development, the project sponsor evaluated other options for their project. After performing some preliminary studies, the sponsor selected the option that is currently being proposed based on its performance and cost.

- 4k) *Coordinate with potentially parallel or competing projects and consolidate projects where practicable.***

As was mentioned before, there are currently no competing or parallel projects to NTP 1. However, other sponsors are developing projects in eastern and northern Arizona and northern New Mexico. DPA will coordinate its studies to account for these other projects. DPA will also coordinate with any other projects that may be electrically adjacent to NTP 1 through its activities with sub-regional groups and WECC groups.

Figure 1



5. Project Schedule and Milestones

Table 1 lists the tentative schedule of regulatory, permitting, construction and operating milestones for both NTP 1 and DREP projects.

Table 1

Activity	Anticipated Completion/Start Dates	
	NTP 1	DREP
Arizona CEC	N/A (1)	N/A
ROD on FEIS	Q1 2007 (2)	Q3 2007
BIA ROW Approval	Q3 2007	Q3 2007
Rating Studies	Q4 2007	Q2 2006 (3)
Construction Start	Q4 2008	Q4 2007
Commercial Operation	Q4 2010	Unit 1 Q1 & Unit 2 Q2 2012

(1) Applies only to segment 3 and was obtained in 2000.

(2) This will be a re-issued ROD for the line.

(3) System Impact Study was completed for the plant in June 2006.

Appendix A

Regional Planning Announcement Letter

Appendix B

Project Rating Review Announcement Letter

Appendix C

Regional Planning Project Review Group Participants

Appendix D

NTP 1 RPPR Group January 24, 2007 Meeting Minutes

Appendix E

NTP 1 Comprehensive Progress Report w/o Appendices

CONDITION 8

The new transmission line shall interconnect with the existing 345kV and/ or 500kV transmission lines at either or both the Red Mesa or Moenkopi substations. If Segment 2 has not been completed, energized, and capable of operating at its rated capacity, then the new transmission line shall interconnect with the existing 345kV and/ or 500kV transmission lines at both the Red Mesa and Moenkopi substations.

RESPONSE

Final design work for this project has not been completed and construction has not commenced. Based on the results of the interconnection studies and the final design for the Project, a decision will be made regarding the interconnection with existing transmission lines at either or both the Red Mesa or Moenkopi substations. The Applicant will comply with the stipulations of Condition 8.