



PATH HVDC Conceptual Study

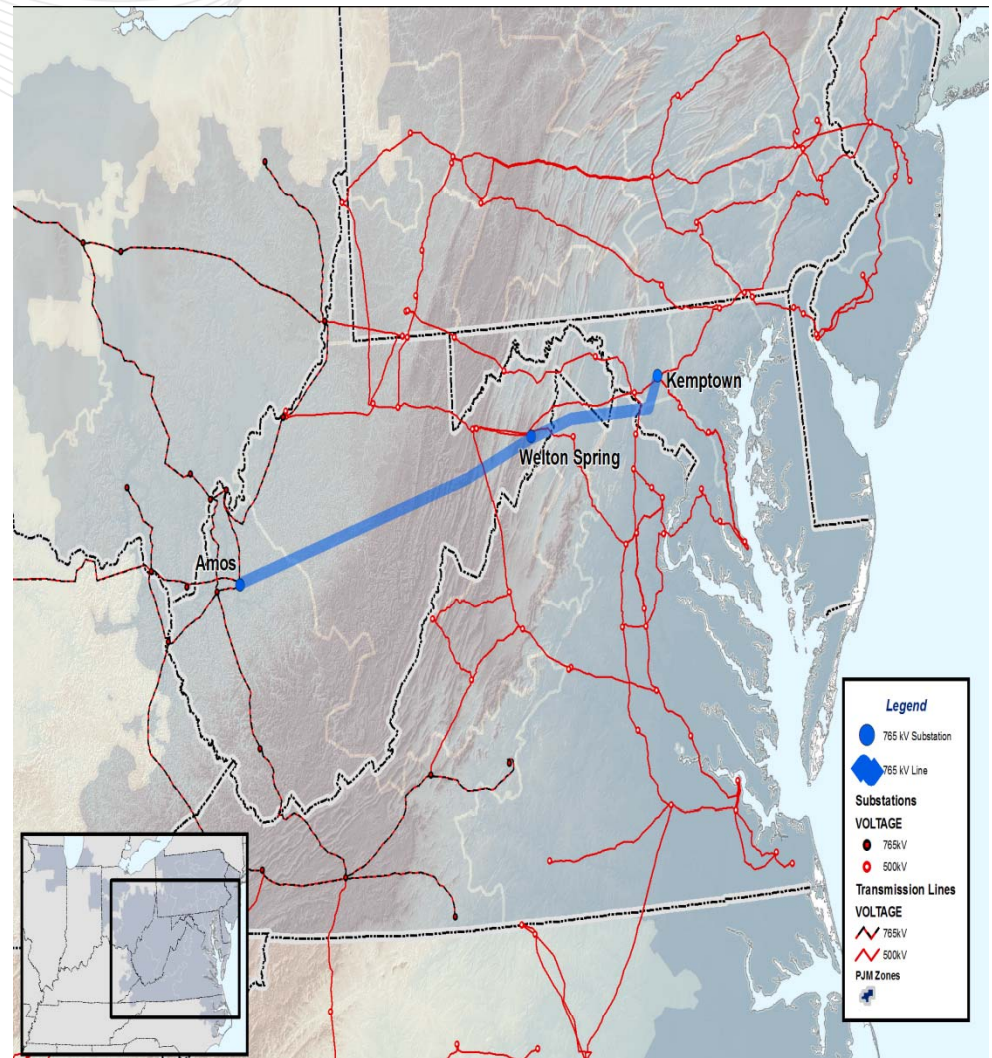
TEAC Meeting

10/22/09

Potomac-Appalachian Transmission Highline (PATH) Project:

- Scope
 - New 765kV line from Amos to Kempton with intermediate Welton Spring 765 / 500kV substation
- Planning Driver
 - Based on the PJM analysis of 2014, the Amos – Kempton project is required to resolve numerous thermal and reactive problems starting June 1, 2014
- APS and AEP assigned baseline project with PJM id's
 - AEP b0490
 - APS b0491 and b0492
- Energization
 - Expected in service: 6/1/2014
- Related Information

<http://www.pathtransmission.com/>



- Develop Scope of work for study
- Solicit proposals from vendors
- Black & Veatch (w/ ABB) awarded PO
- PJM identified project requirements
- Study completed in two steps:
 - Welton Spring – Kemptown
 - Amos – Welton Spring

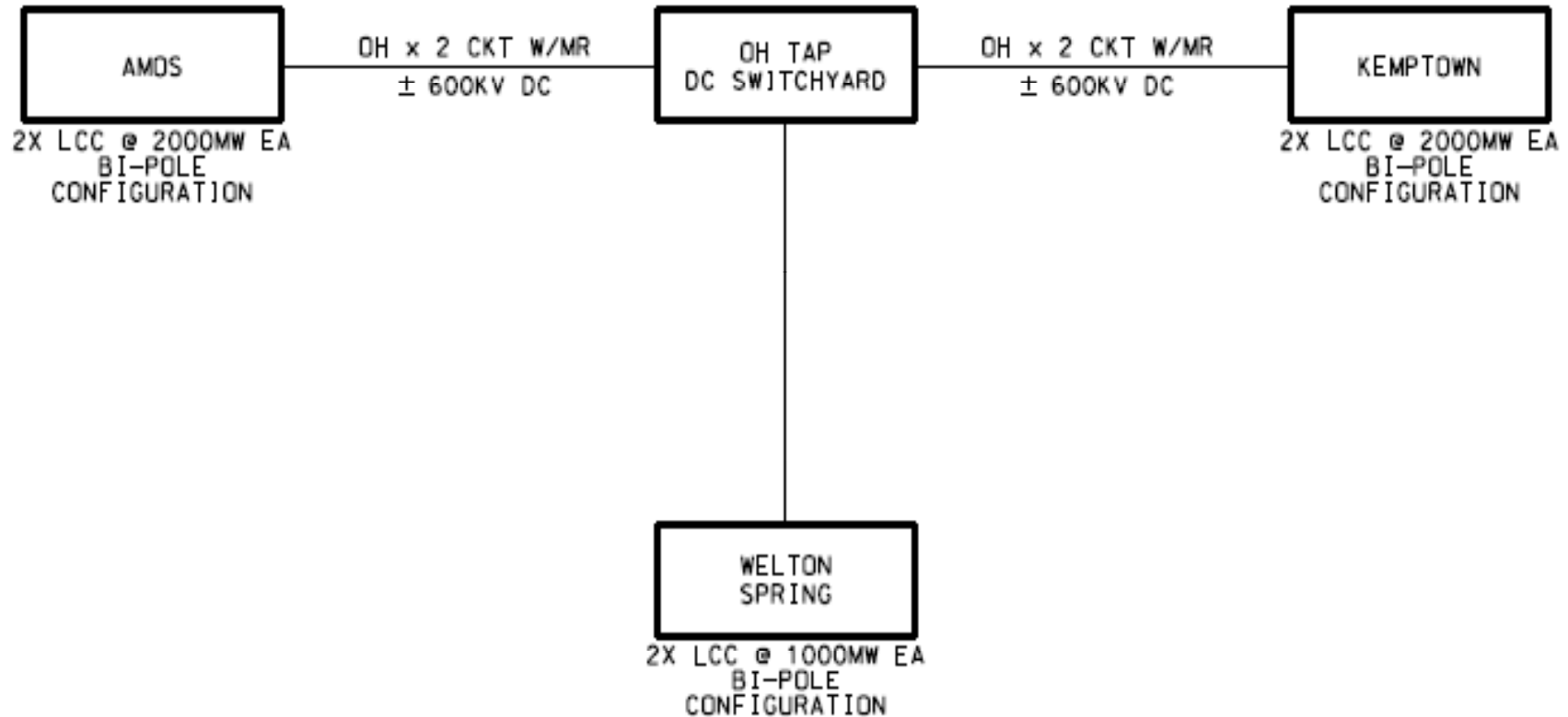
PATH Current Design

Single circuit 765kV AC
overhead transmission
line from Amos -
Kempton

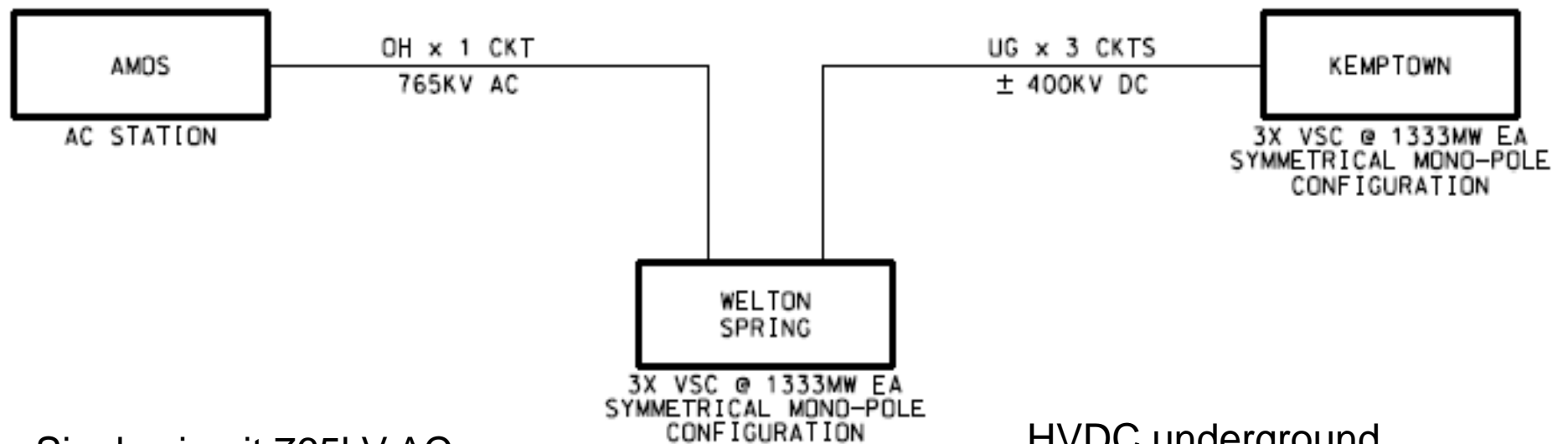
PATH HVDC Study

Concept 1: HVDC
overhead transmission
from Amos-Welton
Spring-Kempton

Concept 2: Single circuit
765kV AC overhead
transmission from Amos-
Welton Spring; HVDC
underground
transmission from Welton
Spring-Kempton



HVDC overhead transmission from Amos - Welton Spring - Kemptown



Single circuit 765kV AC overhead transmission from Amos - Welton Spring

HVDC underground transmission from Welton Spring - Kemptown



Key Physical Features Comparison Summary

	Current Design	Concept 1	Concept 2
Structures			
Max Structure Height	130 ft	150 ft	N/A
Max Structure Width	150 ft	80 ft	N/A
Right-of-Way			
Amos – Welton Spring	200 ft	150 ft	200 ft
Welton Spring - Kemptown	200 ft	150 ft	110 ft



Comparison Aspects HVDC vs. AC

- Permitting
- Future Expansion
- Operations and Reliability
- Maintenance

	Current Design	Concept 1	Concept 2
AC Overhead Line	\$1,204 M	--	\$756 M
AC Interconnection Substations	\$563 M	\$563 M	\$563 M
HVDC Overhead Line	--	\$1,002 M	--
Overhead Tap Switchyard	--	\$8 M	--
HVDC Underground Line	--	--	\$884 M
HVDC Convertor Stations (LCC)	--	\$838 M	--
HVDC Convertor Station (VSC)	--	--	\$1,392 M
TOTALS	\$1,767 M	\$2,411 M	\$3,595 M

- Complete final edits to report
- Post report by mid November