

4.5.2 Columbia Basin Facilities

COLUMBIA BASIN TRANSMISSION COST

Purpose - to split USBR Columbia Basin project transmission costs into the appropriate segments, including Network, Delivery, and Generation Integration (GI).

GI is transmission facilities between the generator and the Network station, including step-up transformers, power house lines or cables, and switching equipment at the Network station for the power house line. The remainder is Network. Delivery includes

The USBR does not have investment data to the level of major piece of equipment. The data is available by major group, as 500 kV switchyard. These costs will be allocated to GI and Network segments based on BPA typical facility costs for the major. The typical costs will be developed for major divisions, as the 500 kV switchyard. The ratio for Network will be developed based on the cost of the equipment that is Network as a ratio of the total cost.

Assumptions/Method

1. Interest during construction (IDC) and other general costs will be allocated based on investment.
2. Typical costs as noted on investment ratio sheet.
3. USBR transmission starts at the high side of the generator breaker (low side of step-up transformer) through the substation per Chris Christoferson/USBR Coulee. This includes the step-up transformers, but not the powerhouse switching. There is no low s
4. Delivery: The 115/13.8 kV facilities at Coulee are used for station service and to deliver power at 13.8 kV to Grant, Coulee City, and Nespelem Valley at Lonepine. An allocation of costs between uses is necessary.

COLUMBIA BASIN COSTS (Grand Coulee) SUMMARY

As of 9/30/97

<u>Segment</u>	<u>Investment</u>
Network	42,963,207
Generation Integration	131,955,389
Delivery	1,146,717
Total	176,065,313

THIRD POWERHOUSE (500 kV Facilities)

Network	16,430,712
Generation Integration	88,297,362
Total	104,728,075

FIRST & SECOND POWERHOUSE & OTHERS

Network	26,532,495
Generation Integration	43,658,027
Delivery	1,146,717
Total	71,337,238

Investment includes IDC.

COLUMBIA BASIN COSTS (Grand Coulee)				
BOR data for investments as of 9/30/97				
Power	Cost	Notes/Source		
Multi-purpose	126,995,675	From BOR assets accounts		
Electric Plant	958,881,635	1/ From BOR assets accounts		
Total	1,085,877,310			
Electric Plant	964,537,093	BOR Financial Structure/asset account		
Irrigation Assignment	(5,655,456)	2/ From BOR assets accounts		
	958,881,637			
13.031 Pump Generator S	1,731,400	3/ from BOR Financial Structu	1,731,400	
Percent Network	None	All GI		12.143%
			GI	1,941,637
13.034 500kV & Other Switchyard	93,388,319	3/ from BOR Financial Structure		
500kV cables 6/ Net sub	(29,897,939) 63,490,380	Not sub-assume 500kV GI		
Percent Network	23.1%	Base on typical costs		
Network Allocation	14,651,626		GI	78,736,693
Percent for IDC 5/ Total Network-500kV	12.143% 16,430,712	from BOR Electric costs		12.143% 88,297,362
13.035 Modified Left Switchyard	60,859,026	4/ from BOR Financial Structure		
Lines 7/ Net sub	(14,775,732) 46,083,294	Not sub - assume 230kV GI		
Percent Network	0.513409627	Base on typical costs		
Network Allocation	23,659,607		GI	37,199,419
Percent for IDC 5/ Total Network-Left	12.143% 26,532,495	from BOR Electric costs		12.143% 41,716,390
TOTAL NETWORK	42,963,207		GI	131,955,389
Percent Delivery	2.2%	Left Yard only 115/12 kV		
Percent for IDC 5/ Total Delivery	12.143% 1,146,717	from BOR Electric costs		
NOTES:				
1/ Assume all transmission is in electric plant.				

2/ Assume this is in pump gen switchyard and power plant.		
3/ Assume this includes all 500 kV line and sub costs; IDC not included.		
4/ Assume this includes all 230 kV and other transmission costs; IDC not included.		
5/ IDC is allocated based on ratio of investment to total investment.		
6/ Assumes cables are all in 500 kV yard and can be removed as a group.		
7/ Assumes all lines are part of left yard and can be removed as a group.		

NETWORK INVESTMENT RATIO-ASSIGNMENT BASED ON TYPICAL SUB COSTS									
BPA typical cost of facilities - 12/11/98									
		<u>No. Units</u>		<u>Unit Cost</u>					
Items	Total	Network	Gen Int	\$000	Total	Network	Gen Int	Delivery	Note
500 kV Switchyard									
500 kV terminal (1&1/2)	11	5	6	4500	49500	22500	27000		
Step-ups 7-800 MVA	6		6	8000	48000	0	48000		3/
Total					97500	22500	75000	0	
500kV - Network % =	23.08%		% w/o step-ups		45.5%				
Left Switchyard (includes 230 & 115 yards)									
230 kV PCB 1/	26	21	5	560	14560	11760	2800		
500/230 tx 1200MVA	1	1		9800	9800	9800	0		
230/287kV tx	1	1		2600	2600	2600	0		
230/115 tx 230MVA	1	1		2600	2600	2600	0		
115kV PCB	7	7		375	2625	2625	0		
Delivery - 20 MVA tx	2			1010	2020		1010	1010	2/
Delivery- feeder terminal	11			130	1430		1170	260	2/
Step-ups 1-125MVA	18		18	1200	21600	0	21600		4/
Total					57235	29385	26580	1270	
Left Yard- % Network	51.3%		Network % w/o step-up		82.5%		% Delivery	2.2%	
						%Del w/o step-up		3.6%	
1/ Some breakers are for bus tie, etc.; these are Network.									
2/ Delivery transformer split 50% to Delivery and station service; based on estimate of 25 MVA with low and hi side PCB.									
Delivery terminals based on 12.5kV feeder cost; split based on 2 for Delivery and rest for station service.									
3/ Cost of 500 kV step-ups are similar to 500/230, so cost of 700MVA without breakers is used.									
4/ Cost of 230 kV step-ups are similar to 230/69, so cost of 75MVA without breakers is used.									