



TransCo Communications and Remote SCADA Systems Asset Valuation

- Final
- 15 August 2005



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1. TransCo Communications and Remote SCADA Systems

TransCo supervise and control the Power Network from a National Control Centre in Diliman via a Communications Network based on Digital & Analogue Microwave links and Fibre Optic Links. To reach remote sites, Power Line Carrier terminals and UHF radio links are used and integrated in the communication system. TransCo also operates a Telephone Network that allows communication throughout the Luzon-Visayas-Mindanao transmission grid.

The National Control Centre (NCC) is backed by fifteen Regional Control Centres (RCC) and Area Control Centres (ACC) located in the three main distribution areas: Luzon, Visayas and Mindanao. The Control Centres are listed in Table 1.

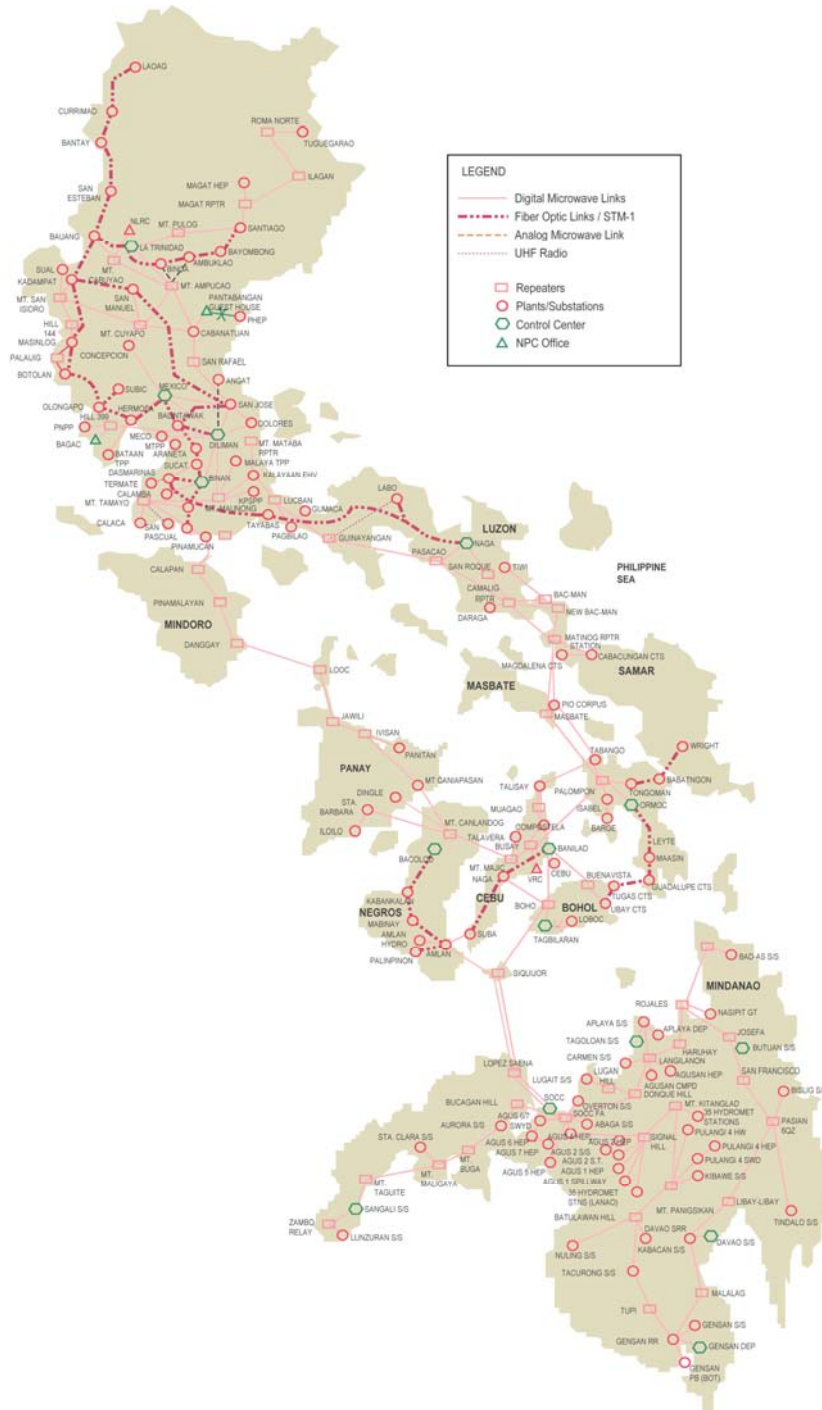
■ **Table 1 Communications and Remote SCADA Valuation Summary**

Area	Location	Area	Location
Luzon		Mindanao	
NCC	Diliman	RCC	Iligan City
NLACC	La Trinidad, Benguet	ACC	Tagelohan, CDO
CLACC	Mexico, Pampanga	ACC	Nasipit, Butuan
SLACC	Binan, Laguna	ACC	Davao City
BACC	Naga City	ACC	Sangali, Zambo
Visayas		ACC	Klinan, GenSan
RCC	Banilad, Cebu		
ACC	Ormoc, Leyte		
ACC	Bacalod, Negros		
ACC	Tagbilaran, Bohol		

Map 1 shows the extent of the TransCo Communications and Remote SCADA Systems.



■ Map 1 Communications and Remote SCADA Systems





The December 2004 estimated Replacement Cost (RC) and Depreciated Replacement Cost (DRC) of the Communications and Remote SCADA System assets is summarised in Table 2.

■ **Table 2 Communications and Remote SCADA Valuation Summary**

System	Region	RC (Php k)	DRC Regulatory (Php k)
Communication			
	North Luzon	Php 876,117.73	Php 571,166.62
	South Luzon	Php 506,329.67	Php 372,205.30
	Visayas	Php 241,446.06	Php 168,634.74
	Mindinao	Php 607,338.61	Php 369,188.11
Total - Communication		Php 2,231,232	Php 1,481,195
Remote SCADA			
	North Luzon	Php 703,453	Php 368,727
	South Luzon	Php 473,899	Php 222,834
	Visayas	Php 284,432	Php 190,709
	Mindinao	Php 740,205	Php 353,427
Total - Remote SCADA		Php 2,201,988	Php 1,135,696
Total		Php 4,433,220	Php 2,616,891



2. Data Sources

The data for the Communications and Remote SCADA Systems was sourced from the Terms of Reference document, the December 2004 Financial Asset Register and financial records from the communications and SCADA groups. Some historical information was also sourced from the TransCo 2002 and 2003 Annual reports, and a reference document by ABB, Switzerland, dated December 2004. The ABB document covers improvements to the supervisory and control network including the installation of the new National Control Centre at Diliman that replaced the Power Management Center in 2002.

The TransCo Communications and Remote SCADA Systems dates back to the late 1960's with equipment installed in 1969 at San Manuel SS. The greater part of the Communications and Remote SCADA systems were however installed between 1993 and 2000 giving the Telecommunications Network an average age of 8.8 years for Remote SCADA and 7.5 years for the Communication system.

The 2004 financial asset register indicates that the bulk of the communications network was installed between 1997 and 1999 with the majority of the supervisory equipment having been installed in 1993 and 1997.

The December 2004 valuation for the Communications and Remote SCADA Systems includes communication and supervisory equipment located at substations and cable termination stations. Pilot cables are included in the Transmission Line assets and do not form part of the Communications and remote SCADA Systems asset register.



3. Load Dispatch Equipment and Accessories

TransCo's Financial Asset Register (FAR) for Load Dispatch Equipment and Accessories, which includes the Communications and Remote SCADA Systems comprises of asset classifications as indicated in Table 3.

■ **Table 3 Load Dispatch Equipment and Accessories**

Subsidiary Account	Description
375	Data Acquisition and remote Control/frequency Control sub-system equipment. Including equipment used at the remote Stations/Plants
376	Process Computer & Man-Machine Interface sub-system Equipment.
377	Microwave System/UHF System Equipment. Including Equipment at the remote Stations/Plants.
378	Telephone System Equipment. Including Equipment at Remote Stations/Plants.
379	Telex/Facsimile System Equipment. Including equipment at remote stations/plants.
380	Flood Forecasting and Warning System Equipment for Dam Operation System. Including equipment at remote stations/plants.
381	Electrical Auxiliaries. Including equipment at remote stations/plants.
382	Mechanical Auxiliaries. Including equipment at remote stations/plants.
383	Civil Structures and facilities. Including Buildings at remote stations/plants.

The FAR is structured by subsidiary accounts, locations, and asset names. A total of 116 locations were identified in the subsidiary accounts for Load Dispatch Equipment and Accessories consisting of both substations and cable termination stations. All the substations are not identified individually in the asset register. Some are lumped together by area making a substation by substation valuation of the Communications and Remote SCADA systems not achievable.



4. Financial Asset Register Verification

The Financial Asset Register records the year of delivery of equipment and not the installation or commissioning dates of assets. Industry practise suggests that equipment is normally installed within one to two years from the time of delivery and the dates were accepted as reasonable for valuation purposes. The average age of the Communications Systems and the Remote SCADA systems as per the FAR corresponds with information obtained through interviews with Telecommunication personnel, suggesting that TransCo has a yearly replacement program to replace aging telecommunications plant. The average ages reflected in the FAR suggests that the telecommunications networks are not allowed to age beyond the expected life.

In instances where installation dates were not available, an installation date was assumed based on available information regarding the development and upgrading of the telecommunications system.

The 2002 FAR data does not include system age profiles and could therefore not be used as a reference. The 2004 FAR indicates that the Remote SCADA Systems have an average age of 8.8 years and the Communications System an average age of 7.5 years. A total asset life of 15 years has been assigned to TransCo's Remote SCADA and Communications Systems. This is the generally used life for telecommunication systems. Assigning a 15 year life would indicate that TransCo's Remote SCADA and Communications Systems have reached 59% and 49% of their asset life respectively.



5. Valuation

The valuation has been conducted generally in accordance with the Optimised Depreciated Replacement Cost (ODRC) valuation principles. A limited amount of interpretation and correction was done by SKM. The valuation summary shown in Table 4 excludes any consideration of land and land rights, buildings, civil works and establishment, spares and construction work in progress (CWIP).

■ **Table 4 Summary of Valuation as of December 2004**

System	Subsidiary Account	RC (PhpK)	DRC Regulatory (PhpK)
Communication			
	377	1,231,926.41	699,785.94
	378	396,369.33	245,894.96
	379	27,945.39	14,973.17
	381	33,436.38	21,720.51
	382	110.00	7.33
	383	24,201.73	13,780.28
<i>Total - Communication</i>		<i>1,713,989.24</i>	<i>996,162.20</i>
Remote SCADA			
	375	1,508,695.62	688,636.54
	376	256,868.93	68,858.97
<i>Total – Remote SCADA</i>		<i>1,765,564.55</i>	<i>757,495.51</i>
Total		3,479,553.79	1,753,657.71

The replacement cost of the Telecommunications Assets in service is based on the Modern Equivalent Assets (MEA) – that is, the assets that would be employed if the network were to be rebuilt today.

The set of MEA rates used in the valuation were established by considering the 2002 valuation and averaging the cost over the total number of assets per asset type in service in 2002. This 2002 equivalent unit rate was then adjusted upwards with the Consumer Price Index (CPI) to obtain a 2004 equivalent unit rate. The MEA rates were verified against turnkey contract prices for projects completed in 1998. Three projects were identified and the result of the verification is shown in Table 5.



■ **Table 5 Verification Results**

Substation	Variance
A	+16%
B	-4%
C	-10%

Of the three substations considered the average accuracy of the valuation is within 10%. However the unit rates for Communications and Remote SCADA systems are derived from the averaging of equivalent installation costs across the telecommunications network and are not specific to any project or substation.

6. Optimisation

The optimisation process is aimed at removing over-design, over-capacity and redundant assets from the Depreciated Replacement Cost.

The 2004 FAR was filtered based on the existence and the status of the assets as defined by TransCo. The criteria used in the optimisation process are summarised in Table 6 and Table 7.

- **Table 6 Optimisation Criteria based on Communications and Remote SCADA Asset Existence**

Existence	Criteria	Qty
Yes	Included in Valuation	1237
No	Excluded from Valuation	35
Blank	Included in Valuation	368

- **Table 7 Optimisation Criteria based on Communication and Remote SCADA Asset Status**

Status	Description	Criteria	Qty
A	Operating	Included in Valuation	1185
B	Retired or Abandoned but still to be used	Included in Valuation	12
C	Transferred to other location	Included in Valuation	13
D	Not operating; under general repair for < 1 year	Included in Valuation	1
E	Not Operating; Under general repair for > 1 year	Included in Valuation	2
F	Retired and for disposal	Excluded from valuation	15
G	Disposed	Excluded from Valuation	3
N/A	Not applicable	Excluded from Valuation	26
Blank	No entry	Included in Valuation	383



7. Residual Life

When an asset reaches the end of its category or class life, it has zero value under a strict straight line depreciation method. However, it is typical for assets to remain in service beyond this category or class life, and therefore it is reasonable to allocate some residual value to these assets to recognise their continued contribution to the network.

In the valuation of the Communications and Remote SCADA assets, a residual life of one year for regulatory purposes has been applied.