

NAME : Doug Ray (presenter)  
COUNTRY : New Zealand  
REGISTRATION NUMBER : 7366

GROUP REF. : B4  
PREF. SUBJECT : PS3  
QUESTION N° : 3.1

---

When an SVC needs refurbishment work, does your utility consider replacing it with a STATCOM? Do the SVC's degraded operation modes impact this decision? What is the utility's experience in specifying the IGBT valves' redundancy in STATCOM converters? Does the overvoltage inductive cycle specified in your network for SVCs/STATCOMs come from simulations or technical guidelines?

#### **Transpower's experience with SVC Life Extensions**

Transpower New Zealand has taken the approach of life extension of both HVDC and power electronics equipment based on the condition of the assets, network requirements, and economic considerations such as the whole of life cost. We have committed to refurbishing multiple SVC's across the network as many primary plants are still in good condition while the control & protection system and some auxiliary plant such as the cooling systems are becoming unreliable or obsolete. The whole of life cost of this option is cheaper than upgrading to a modern STATCOM.

Primary plant such as the capacitor banks, reactors, and unit transformers have longer life expectancies when compared to many secondary and auxiliary systems. Similarly, the SVC's have been designed and operated conservatively to minimise insulation aging. Therefore, where applicable, primary plant has been retained following the refurbishment. Condition assessments have been carried out when scoping the refurbishment work as an added measure to plan and replace any plant that may not last the remaining life of the facility.

Due to obsolescence and reliability issues, control and protection systems have been replaced as part of life extension works. Valve replacements and cooling system upgrades were also carried out in some cases due to their integral nature.

Transpower New Zealand experience has been that Multi-level STATCOM power module failure rates are much higher than SVC thyristor failure rates. Replacement power modules are also much more costly to purchase than thyristors.

Transpower New Zealand specifies availability requirements on our STATCOM specifications, and the manufacturer will determine the level of IGBT valve redundancy accordingly.