

Technisches Englisch

Global electric 'power highways' could become a force for peace

Elektrotechniker sollten englischsprachige Dokumentationen und Pläne lesen können. Diese Seite erleichtert den Zugang zur englischen Sprache und vermittelt elektrotechnische Fachausdrücke.

*One day there will be a global electricity network that **links** all countries of the world. It will **take decades** to complete but the first **steps have already been taken** and the principle is **deemed workable**.*

A **key benefit** will be a reduction in the number of power stations that are needed globally. During night time, for example, **any given** country's generators can be **kept running** efficiently by **supplying** the extra **needs** of other countries during their working hours **further** round the globe. It will also help balance the different types of power generation **indigenous** to different countries. Nuclear power stations can **take** several days to switch on or off, so they are best at **providing** continuous **base-load** electricity. But a hydropower generator can be started in minutes, making it ideal for **meeting surges**. For example, Switzerland imports base-load electricity from French nuclear power plants, but exports power from its Alpine dams in short **bursts** to meet France's **peak needs**. **Any one** country does not have to **cater for** all **contingencies** because it can use resources from **elsewhere**. A global network will **enable** easier access to **major sources** of energy that are uneconomical to reach just now. The Himalayan **kingdom** of Nepal, for example, is a **remote** region with a large hydroelectric potential. Such a **grid** will increase security of supply, reduce the need for new **power plants** and **cut back** on the primary electricity reserve **requirements** within each country. This includes the use of **spinning reserve** where a station is **semi-powered** so it can take over very quickly if another station **fails** or if **demand rises** sharply. **Apart from** economic and technical **hurdles** to be **overcome**, there are two quite different **outlooks** to **reconcile**. European networks

are highly **meshed**, **consisting of high voltage** lines, with high **consumption** and high **density** of consumers, and **predictable load patterns**.

But grids in the Southern **Mediterranean** region are typically lower voltage grids, **non-redundant**, serving **fewer** loads, concentrated in highly **urbanised** areas, and **strung out** through the countryside at lower voltages. Siemens Power Transmission and Distribution Group is one company **keeping an eye on** these developments. The group is already very active in **HVDC** around the world. **Currently**, it is working with local companies to **construct** a link in southeast China.

The US\$121million contract was **awarded** by China Southern Power Grid Company in Guangzhou and the project **is expected to be connected** in 2007. The new HVDC **transmission line** will **eventually provide** electricity from the hydro and **coal fired power plants** in the west of the country to the industrial districts in Guangdong. India's largest power transmission project, the East-South HVDC Interconnector II, was completed by Siemens PTD Group **ahead of schedule**. It links the states Karnataka and Orissa over a distance of 1450 km – the second longest HVDC link in the world – with a **bulk power** of up to 2000 MW. Siemens says HVDC is the only technically and economically **feasible** solution for interconnection of asynchronous grids and for power transmission over large distances between **generation** and **load centres**.

Today, **although** most grids are **ac**, more **dc** lines are being installed and the **backbone** of a global grid will **probably** be HVDC. Such links are less costly than ac versions because they need only two main **conductors** while an ac line needs three. And the **losses** are lower. But HVDC converter stations cost more than the ac terminal stations so HVDC may not be economical over short distances, **unless** **earth return** can be used to further reduce transmission line costs. The major **advantage** of HVDC is its **controllability**. There is no need to synchronise power stations and grids with each other and there are no problems with **phase change** over distance, so stability is no problem. The basic power control is **achieved** through a system where one of the **converters** **controls** its dc voltage and the other converter controls the current through

the dc circuit. The control system acts through **firing angle adjustments** of the **thyristor valves** and through **tap changer** adjustments on the converter transformers. A **back-to-back** HVDC station can be used to link two ac grids. This system **isolates** each grid from **fault** conditions and **disturbances** on the other and **eliminates** the need for synchronisation while **allowing** two-way power transmission.

By courtesy of Engineer Live

ac = alternating current Wechselstrom
achieve erreichen, erzielen
adjustment Anpassung, Einstellung
advantage Vorteil
ahead of schedule vorzeitig, eher als geplant
allow erlauben, ermöglichen
although obwohl
any given irgendein, jedes beliebige
any one jedes einzelne, jedes beliebige
apart from außer, neben
award gewähren, vergeben, verleihen
backbone Wirbelsäule, Rückgrat
back-to-back Rücken an Rücken, aufeinander folgend, nacheinander
base load Grundlast, -versorgung
bulk power große elektrische Leistung
burst Platzer, Stoß, Ausbruch
cater for sorgen für, verpflegen
coal fired power plant Kohlekraftwerk
conductor Leitung, Aderleitung, Leiter
consist of bestehen aus
construct errichten, aufbauen
consumption Verbrauch
contingency Eventualfall, Möglichkeit
control steuern, regeln
controllability Kontrollierbarkeit
converter Wandler, Umrichter, Umformer
currently aktuell, zurzeit
cut back drosseln, kürzen, mindern
dc = direct current Gleichstrom
decade Jahrzehnt
deem halten für, erachten als
demand Nachfrage
density Dichte
disturbance Störung
earth return Erdleitung
eliminate eliminieren, ausschalten
elsewhere anderswo
enable ermöglichen
eventually schließlich, letzten Endes
fail scheitern, fehlschlagen
fault Defekt, Fehler, Fehlfunktion
feasible mach-, umsetzbar
few, fewer wenige, weniger
firing angle Zündwinkel
force for peace Kraft für den Frieden
further weiter
generation Erzeugung
grid Gitter, Raster, Stromnetz
high voltage Hochspannung(s-)
hurdle Hindernis, Hürde
HVDC = high voltage direct current Hochspannungs-Gleichstrom

indigenous (ein-)heimisch, landeseigen
is expected to be connected soll/wird voraussichtlich angeschlossen werden
isolate absondern, abtrennen, abblocken
keep an eye on aufpassen, beobachten, im Auge behalten
keep, kept, kept running am Laufen halten
key benefit Hauptvorteil, Hauptnutzen
kingdom Königreich
link verbinden; Verbindung
load centre Last-, Belastungszentrum
load pattern Auslastungsverlauf, -muster
loss Verlust
major sources Hauptquellen
Mediterranean Mittelmeer
meet bewältigen, auffangen
meshed vermascht, verwoben
need Bedarf, Nachfrage
non-redundant redundanzfrei
outlook Aussicht, Prognose, Szenario
overcome bewältigen, überstehen
peak need Spitzenbedarf, -verbrauch
phase change Phasenübergang, Phasenwechsel
power plant Kraftwerk
predictable vorhersagbar
probably wahrscheinlich
provide liefern, bereitstellen
verfügbar machen
reconcile abstimmen, in Einklang bringen
remote weit entfernt
requirement Anforderung, Anspruch
rise ansteigen
semi-powered halb ausgelastet
spinning reserve Spinning-Reserve (ständig mitlaufende Reserve für Stromausfälle)
steps have been taken Schritte sind unternommen worden
string, strung, strung out auseinander ziehen, *hier*: verteilen
supply versorgen, liefern, beschaffen
surge plötzlicher Anstieg, Stoß
take nehmen, *hier*: brauchen (Zeit)
tap changer Stufenschalter, Abzapfwechsler
thyristor valve Thyristorventil
transmission line Fern-, Übertragungsleitung, Hochspannungsleitung
unless es sei denn, falls nicht
urbanise urbanisieren
workable aus-, durchführbar, betriebsfähig

P. Zillmer

