

The feasibility of this technology has also been tested on wild manatees⁴. The Crittercam has also been deployed on Hawaiian monk seals, humpback whales, reef sharks, etc. An Oscar winning documentary, 'March of the penguins' carried information and footage obtained from the Crittercam⁵.

Although the Crittercam is not being used yet in India, it can prove to be a useful tool in addressing issues related to conservation. Since it is more successfully used on marine species, it can further add to the knowledge on species like the Olive Ridley turtles that have mass nestlings on the Gahirmatha coast, Orissa. Satellite telemetry is used to study their

movement, but deployment of the Crittercam can add to this knowledge, since it records audio and video images.

At times, lack of data or insufficient data may render it difficult to assign a status to animals, based on certain parameters like population size, foraging ecology, predator pressure, migration, movement, etc. The Crittercam is certainly the answer to this problem.

Many marine species along the Indian coasts today are threatened, including the Olive Ridley turtle, green turtle, Gangetic dolphin, gharial and crocodile, which are in need of attention from conservation biologists. Data collection on these species can be augmented by use of Crittercam.

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4. Adimey, N. M., Abernathy, K., Gaspard, J. C. and Marshall, G., *Mar. Technol. Soc. J.*, 2008, **41**, 14–18.

5. www.wikipedia.org

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MEETING REPORT

Grid security and management*

The Indian power sector is currently passing through an evolutionary phase and there are numerous challenges that it is facing to bring about the desired changes. The first and the foremost challenge is the adequacy of power supply. To meet the same, the Government of India has embarked on an ambitious plan to add more than 80,000 MW capacity by the end of the current Plan (i.e. end of 2012), to the existing capacity of about 141,000 MW built-up during the last five decades. Further, even after adding this large capacity, wheeling it to the distant locations to ultimately reach the end-user would be possible only if commensurate growth in the transmission sector matching with that of generation capacity addition is achieved simultaneously. In this direction, a large number of inter-state and inter-regional transmission links have been added in the recent past in different areas of the country. By virtue of this, we have been able to achieve seamless flow of power from surplus to deficit areas, thereby meeting higher demand. How-

ever, this addition of the transmission network has also brought with it a variety of operational, commercial and techno-economical issues and has thrown fresh challenges to the grid operators in the form of heavy loading of the lines, skewed load-generation pattern, etc. The above complexity and challenges emphasize the need for adopting fast and reliable grid security measures and use of modern and intelligent technologies, so that the vast network in the grid can be managed in an integrated mode of operation. In order to address these issues, a two-day workshop on 'Grid Security and Management' was organized recently. It was a well accomplished workshop attended by over 150 delegates from power utilities, industry, regulatory agencies, and academic and research institutions from different parts of the country.

Santhosh N. Hegde (Lokayukta, Government of Karnataka), while inaugurating the workshop stated that the ultimate objective of all power utilities must be to improve the electricity supply to the needy and the poor. The distribution of electricity should be taken up with the ordinary citizen in mind, with a special focus on the rural and economically weaker sections of the society. Further, he stated that the supply of electrical energy is one of the most important human requirements and there is a need to bring about improvements in all the disciplines

of electricity supply, i.e. generation, transmission and distribution. He particularly emphasized on adopting ways and means to plug distribution and transmission losses.

R. P. Singh (Powergrid Corporation of India Limited (POWERGRID)) in his keynote address stated that in view of the rapid economic growth in the country, slowly the business of supply of electricity is moving away from being considered as a public service to a full fledged economic activity, leading to the establishment of open electricity market. The electricity supply industry which in the beginning was solely under the purview of government agencies is getting ready for private sector presence in a large scale in all facets of electricity supply. Entry of private entities in the power sector has been aimed at marshalling requisite investment into the sector as well as to usher in competition and improved efficiency of operation. These changes, however, have brought along with them numerous issues which were earlier non-existent. He stated that all power engineers must gear up to meet the challenges arising out of the significant role which electricity has assumed in the present conditions.

P. K. Shetty (NIAS, Bangalore and POWERGRID) emphasized that the economy in India is growing at a fast pace and electrical energy has become one of the prime movers in this process.

A report on the two-day workshop on Grid Security and Management organized by Powergrid Corporation of India Limited in association with Karnataka Power Transmission Corporation Limited and IEEE Power Engineering Society, Bangalore Chapter at the National Institute of Advanced Studies, Bangalore on 28 and 29 April 2008.

To accomplish this, the nation has set itself a target of providing electricity to all households by the end of the current Plan by increasing per capita electricity consumption from the current level of around 650 to 1000 units. The desired goal, however, can be achieved only with the concerted efforts by all the players associated with the electricity industry. Further, he informed that in addition to bridging the demand-supply gap in the country, which is of the order of 13–14% during the peak period and 9–10% in terms of energy, another important challenge is to manage the safety and security of the grid. He added that the theme of the workshop is truly representative of the importance of this subject in today's context and the outcome of this workshop could be of further help in managing the safety and security of the grid.

V. Ramakrishna (Central Electricity Authority) stated that in the present scenario, day-to-day management of the grid has become quite complex as it has not remained limited to the security-related issues, but also has to take care of many other issues, including commercial and legal functions and as such the personnel associated with grid operation do not have an unenviable job. According to S. Majumdar (POWERGRID), at the initiative of POWERGRID, the Regional Load Despatch Centres, including a good extent of the State-level facilities also have been modernized, to manage the grid in the best possible manner. In our country there has not been total grid collapse in the last 4–5 years, which is a good performance, particularly taking into consideration the fact that even in the developed countries, grid outages are not eliminated. With the increasing size and connectivity, the operation of the grid is becoming more and more complex. Thus we have to discuss and employ the best possible techniques for keeping the grid integrated and disturbances-free.

With the passage of time, the Indian power sector has grown from an isolated system around urban and industrial areas to State grid systems during the 1950s and 60s. The concept of 'regional grid' was initiated in 1964 and regional grids were consolidated during the 1970s and 80s, with the main objective to achieve power evacuation and supply to area load centres in the region and ensure reliability of supply. In the late 1990s, the focus shifted towards the 'National grid', with the objective to harness hydro resources

in the Himalayan and northeastern regions and coal (thermal) in the eastern region for the ultimate benefit on all-India basis. It was accompanied with the phased development of cross-regional transmission system with long-term perspective to address Right of Way (ROW) and corridor congestion issues. V. Ramakrishna (Central Electricity Authority (CEA)) during his presentation discussed in detail the growth of the power system in the country and future perspectives. The challenges in power system planning on account of uncertainty in load growth, changes in generation programme, ROW constraint and utilization of hydro potential in the Northeast were also explained. He emphasized the need for rationalizing the transmission tariff to encourage investment in the transmission sector.

R. N. Nayak (POWERGRID) in his presentation on 'Emerging technologies in transmission system', deliberated upon the status of the present transmission network which includes about 78,000 circuit kilometres of 765/400 kV lines and 115,000 circuit kilometres of 220/132 kV lines spread across the length and breadth of the country. He added that presently the inter-regional capacity in India is more than 17,000 MW, which will be over 37,000 MW by the end of 2012. He also discussed in detail about the need for new technology in the transmission sector in order to attain rapid growth. He reiterated that to achieve this, focused attention is being given in all stages of the transmission system, including planning, design, construction, operation and maintenance and grid management. He was of the firm view that the desired growth in the transmission sector, matching with that of generation capacity addition can be achieved only if high priority is given to R&D efforts to explore and develop the new technologies. In this regard he appraised the significant work done by POWERGRID in the recent past, which includes implementation of FACTS (flexible AC transmission system) for increasing the power transfer capacity of existing lines, building of 800 KV AC system, multi-circuit/multi-conductor lines, high-rise/compact/pole-type towers and commissioning of GIS (gas-insulated sub-stations) for optimal utilization of space.

In the session on 'Enhancement of grid economy and efficiency', distinguished speakers deliberated upon the ways and means to bring in economy and effi-

ciency in the power sector in the country. V. K. Agrawal (Southern Regional Load Despatch Centre, Bangalore) discussed in detail the logistics associated with the open access in transmission, its journey since inception, issues associated with it and the way-ahead. D. P. Sen Gupta (Indian Institute of Science (IISc), Bangalore) presented a case study pertaining to energy saving by advancing the Indian Standard Time by half an hour. Atul Shah (Suzlon Power Infrastructure, Pune) made a presentation on the current scenario in respect of the wind energy in the country, its connectivity to the grid and the main issues faced by wind-form developers. Pratap Kumar (KPTCL, Bangalore) presented the scheme and action plan for the distribution system automation planned to be carried out in Karnataka's transmission and distribution system, and the likely advantages the State would get with such measures.

While making a presentation on the subject 'Environment and electricity power generation', J. Srinivasan (IISc) informed that during the 20th century, there has been a remarkable increase in electricity generation by the burning of coal, oil and natural gas, causing a large increase in the amount of carbon dioxide in the atmosphere. He added that the increase in greenhouse gases like carbon dioxide and methane has caused the global mean temperature to increase by 0.7°C. If the electricity generated by power plants (by burning fossil fuels) in the 21st century increases at the same rate as in the 20th century, then the global mean temperature may increase by 2–4°C. This can lead to extreme weather events, rapid melting of glaciers and increase in sea level. It was emphasized that there is an urgent need to look for a new method of electric power generation, including wind and solar power that does not cause an increase in carbon dioxide. He was of the view that though these technologies are expensive at present, they can become economical if techniques of mass production are employed. Bhanu Bhushan (Central Electricity Regulatory Commission) delivered a talk on the electricity market design in the Indian context. He discussed about the adverse grid parameters which prevailed in the past for sustained durations, the primary causes for the same and the effects of these on the consumers and electricity industry as well as the commercial mechanism in the form

of availability-based tariff (ABT) implemented in the country in order to address a large number of issues and the achievements thereof. He also emphasized on the further work required to be carried out in the electricity sector, including linking of incentives to thermal generation with plant availability instead of plant load factor, rationalization of tariff structure in respect of hydro plants, payment security for unscheduled interchanges and implementation of intra-State ABT, etc.

S. K. Soonee (POWERGRID) made a presentation on 'Grid operation and control – Issues, concerns and expectations'. He outlined the growth story in the Indian power sector in the fields of generation, transmission and interconnection, the modernization at the control centres, evolving power market and the main concerns faced by the sector as a whole. He also discussed the issues related with power system reliability, impact of unforeseen inclement weather conditions and associated factors on the grid, tools for visualization and situational awareness for grid operation, and also about the balancing market in the electricity industry.

In the session on 'Grid security: Issues and avenues', R. Nagaraja (Power Research & Development Consultants Pvt Ltd, Bangalore) discussed the electric grid and the need for creation of intelligent grid. The performance metrics associated with the integrated grid are

reliability, power quality, security, economy, environmental implants, efficiency and sustainability. He highlighted the two specific metrics, viz. grid security and economy in detail. In his presentation, Sethuraman Ganesan (ABB Ltd, Bangalore) elaborated on the importance of the Wide Area Monitoring (WAM) system in real-time monitoring of the power system. Unlike estimation of the system state which was being done in the past, WAM results in better visibility and control of the system. He also stated that automatic high-speed control of the grid using WAM is an evolving model in many systems worldwide. M. M. Babu Narayanan (Central Power Research Institute, Bangalore) in his presentation addressed the issues involved in the secure operation of the power system and explored the application of some of the standard knowledge management techniques, such as knowledge portals, mentoring, etc., to enhance the performance of the system operators.

In a panel discussion, speakers in the various sessions discussed and responded to a variety of issues raised by the participants, ranging from grid security and control, open access in transmission, regulatory principles and the problems faced by them in following certain stipulations as contained in the Indian Electricity Grid Code and other such statutory documents. Some of the participants also brought to the attention of the panelists their experiences and difficulties in re-

spect of certain short-term open access cases they had applied in the recent past and their suggestions to amend the regulations to take care of such issues. A large number of questions were also raised relating to the existing tariff in the case of transmission/short term open access (STOA) and suggestions for their further rationalization. This workshop was planned mainly to spread more awareness and information amongst the power utilities, industry, regulatory and planning authorities, and the academic and research institutions about the grid security and management issues being faced by the power sector in today's context. These were deliberated in the workshop in detail, so that a message could be spread amongst a wider section of people about these specific issues and the action plans required to address the same. The workshop also gave a good opportunity to the participants to have an in-depth knowledge about the development of the intelligent grid comprising WAM systems, adoptive islanding and self-healing aspects, etc., in order to facilitate grid operation with safety, security and reliability.

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MEETING REPORT

Hypospadias*

Hypospadias is the second most common congenital anomaly in children. The urethral meatus is positioned either along the ventral shaft of the penis or on the scrotum or perineum instead of being located at the tip of the penis. This is a relatively common condition, occurring in about 1 of 150 live male births. In the more common and less severe forms of hypo-

spadias, the urethra is located at or distal to the corona of the penis; these conditions frequently do not necessitate treatment, except for cosmetic purposes. The less common but more severe forms of hypospadias, in which the meatus is located on the penile shaft or in the perineum, may interfere with normal urination in the usual male standing position and may, in adult life, interfere with fertility, because the semen is deposited in the distal vagina rather than at the cervix. Hypospadias is typically diagnosed postnatally at the time of delivery. With the

advent of prenatal ultrasound, it is now possible to identify the anomaly prenatally. Such cases are best corrected early in childhood to avoid social embarrassment and psychological trauma.

To reduce surgical complications and to look at the advances in surgical techniques and train paediatric urologists to meet the growing number of hypospadias surgeries, the KLES Kidney Foundation, Belgaum organized a live and video workshop on hypospadias. There were 94 participants from different healthcare institutes of India.

*A report on the 'National Hypospadias workshop' held at KLES Dr Prabhakar Kore Hospital and MRC, Belgaum during 19–20 April 2008.