WORLD POWER SYSTEMS REVIEW

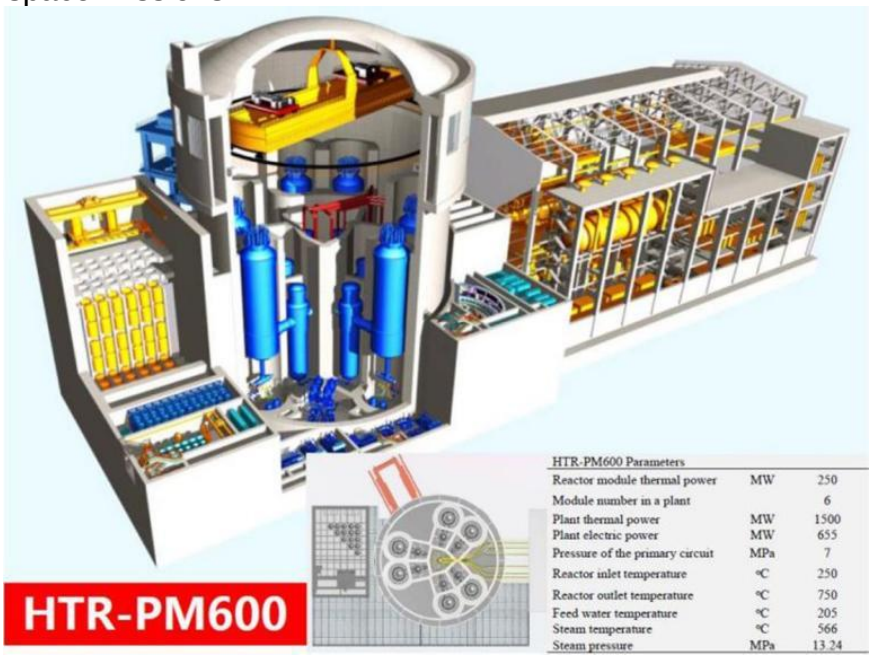
1 January 2024

15 December 2023

China's pebble bed reactor finally starts commercial operation

China's HTR-PM (High Temperature) modular pebble bed reactor has finally started commmercial operation. It has two small reactors (each of 250 MWt) that drive a single 210 MWe steam turbine. It uses helium as coolant and graphite as the moderator. Each reactor is loaded with more than 400,000 spherical fuel elements ('pebbles'), each 60 mm in diameter and containing 7 g of fuel enriched to 8.5%. Each pebble has an outer layer of graphite and contains some 12,000 four-layer ceramic-coated fuel particles dispersed in a graphite matrix.

It is the world's first commercial modular high temperature gas-cooled reactor nuclear power plant. It is a Gen IV reactor. The main reactor elements are transportable on rail or via large trucks. This is far smaller than regular nuclear reactors. This pebble bed could also be used for nuclear submarines, nuclear aircraft carriers or for space-based energy for moon bases or other space missions.



First concrete for the demonstration project was poured on December 2012, with the operating permit granted in August 2021 and the plant connected to the grid in December 2021. The plant has more than 2200 sets of first-of-a-kind equipment, including more than 660 sets of innovative equipment. The supporting fuel element production line has the largest production capacity in the world.

Beyond the HTR-PM, China proposes a scaled-up version – HTR-PM600 – with one turbine rated at 650 MWe driven by six reactor modules.

Zhang Zuoyi described the techniques that will be applied to lower the costs; he expects them to soon approach the $2,000 to $3,00 / kw capacity range. If this can be achieved then the 210 MW reactor would be $420 to $600 million. A 630 MW reactor would be $1.2 to $1.8 billion. It could be less if the 600 MW reactor only had to have the thermal unit and could use the turbine and other parts of an existing coal plant.

The HTR-PM600 commercial system will have less than 40% of the costs for the HTR-PM. This would have costs of about $2500 per KWe. The 600 MWe unit would cost $1.5 billion if that cost target could be reached.

NextBigFuture
http://www.nextbigfuture.com/

15 December 2023

PJM Board approves $5 billion transmission expansion

The PJM Board of Managers on Dec. 11 approved an estimated $5 billion package of transmission projects in the third window of its 2022 Regional Transmission Expansion Plan. In its announcement of the approval, PJM said it is forecasting 7,500 MW of new data center load in Virginia and Maryland, much of which is expected to be clustered around Dulles Airport in Northern Virginia. The RTO is also expecting about 11,000 MW in generator deactivations, most notably the 1,295-MW Brandon Shores plant outside Baltimore.

The package is made up of dozens of components submitted by Dominion Energy, FirstEnergy, Exelon, PPL, NextEra Energy, Transource Energy and Public Service Enterprise Group. The work includes constructing new 500-kV lines from Northern Virginia northeast to the Peach Bottom substation in Pennsylvania, northwest to the 502 Junction substation in West Virginia and south to the Morrisville substation in Southern Virginia.

The board's approval caps off a process that began with the opening of the competitive window for transmission owners to submit projects in February. The normal 90-day window was extended to close May 31, and PJM presented three shortlisted packages on Oct. 3 before an Oct. 31 presentation of the proposal to the Transmission Expansion Advisory Committee that it ultimately brought to the board.

Maryland Office of People's Counsel Deputy William Fields told RTO Insider that presenting the recommended set of projects at the end of October with the plan of bringing it to the board in December left little time for stakeholders and the public to evaluate the projects and draft comments to the board to allow them to come to a fully informed decision. "It's certainly true that this general issue has been talked about for many months, but we saw this actual list of projects Oct. 31. And here it is weeks later being approved," he said Wednesday. Fields said his office had received high-level information about cost allocation from PJM on Dec. 12 and is in the process of evaluating the potential impact to Maryland ratepayers.

The functioning of the cost allocation formula in PJM's tariff is understood by stakeholders, but Fields said that the scale of the package will present that methodology with a test it has yet to face. "We've just gotten some preliminary information, and we're trying to evaluate it and look at it in more detail. But the question is, does the usual allocation method produce reasonable results when you're talking about extremely large amounts of new load?" he said. During the second read of the proposal at the TEAC meeting Dec. 5, several members of the public objected to the package, citing concerns about disruption to historic regions along the proposed route, the inclusion of greenfield construction components, the cost and the likelihood of requiring additional major transmission expansions should load growth continue in the region.

PJM's Sami Abdulsalam said the proposal represented the most efficient, cost-effective and resilient combination of the 72 project submissions received during the competitive window and that minimizing greenfield disruption and siting risk were among staff priorities. The RTO included with its TEAC meeting materials an FAQ detailing its role in selecting the proposals in the window.

RTO Insider
http://www.rtoinsider.com/

18 December 2023

Renewables cover over half of German electricity consumption

The Center for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW) and the German Association of Energy and Water Industries (BDEW) predict that roughly

52 percent of the electricity consumed in Germany in 2023 will come from climate-friendly sources.

That's a new record. According to the organizations, 267 billion of 517.3 billion kilowatt hours will be generated sustainably. A record 113.5 billion kwh will come from on-shore wind. "The numbers show that we're on the right track," said BDEW Chairwoman Kerstin Andreae in a statement. But more milestones will have to follow in coming years if Germany is to reach its climate goals. The country's Renewable Energy Sources Act stipulates that by 2030, eighty percent of electricity used in Germany must be sustainable.

GTAI
http://www.gtai.de/

18 December 2023

Argentina's Milei declares energy sector emergency, sets stage for price hikes

Argentina's new libertarian President Javier Milei announced a power sector "emergency" on Monday, saying his government would tighten control over the country's local gas and electricity regulators, and seek to allow long-controlled prices to rise. The outsider economist, who rode to power pledging to take a 'chainsaw' to state spending, has long targeted energy and transport subsidies that cost the government around $12 billion last year and keep people's bills at around 15% of cost. Energy costs pose a major challenge for Milei, who took office this month. He has pledged to overturn a deep fiscal deficit, but hiking energy bills will fan inflation already nearing 200% and hurt Argentines with two-fifths in poverty.

In a decree, the government said that low energy prices had led to a lack of investment in the gas and electricity grid, adding that it would look to permit prices to rise in accordance with free market competition to "guarantee continuous supply". It added that until a tariff review was done, authorities could approve temporary rate increases and periodic adjustments. "If urgent measures are not adopted, the poor quality of service described will worsen to the detriment of users," it said. The decree also said the government would look to intervene in state electricity regulator ENRE and gas watchdog ENARGAS from the start of 2024, with government officials reviewing the working of the entities.

Reuters
http://www.reuters.com/

18 December 2023

Viking Link: world's largest interconnector days away from being put into operation

Danish transmission system operator (TSO) Energinet is getting ready to bring the Viking Link, which is said to be the world's longest electricity interconnector, online by the end of the year, establishing a subsea cable connection between the UK and Denmark. This will be done at a limited capacity, which is lower than previous expectations before the project can go into high gear once other pieces fall into place.

The Viking Link is expected to be put into operation on December 29, 2023, with an 800 MW import and export capacity of the new electricity connection between Denmark and England. Energinet explains that the full capacity of 1,400 MW cannot be offered to the electricity market from the start, as the West Jutland high-voltage grid has not yet been developed sufficiently.

The TSO elaborates that the existing electricity grid is at risk of overloading and resulting in a supply failure if the Viking Link high voltage direct current (HVDC) interconnector is given free rein to kick off its full capacity from day one, threatening the security of supply in the whole of Western Denmark. With this at the forefront, Energinet is

working on market and operational measures, which can continuously increase the possibility of even more import and export of power across the North Sea.

When Viking Link was adopted in 2015, it happened at the same time as it was decided to expand the 400 kV high-voltage grid in West Jutland from Idomlund by Holstebro in the north to the Danish-German border in the south, thus, the projects were mutually dependent. However, the expansion of 400 kV connections along the west coast has run into several delays due to stricter requirements for environmental approvals.

Therefore, the spades on the new 400 kV connections have only just been put in the ground, and are not finished at the same time that Viking Link can be put into operation. If the capacity goes full throttle, in addition to the risk of overload and security of supply, it will also mean that large amounts of Danish electricity production from wind turbines, in particular, will have to be stopped for periods, as the electricity can easily be sold to England, but not come through the West Jutland grids on the way over there.

Energinet points out that the expansion of the 400 kV network along the west coast of Jutland will greatly increase the capacity of the western Danish high-voltage network and thus enable the full capacity of the Viking Link. The first part of the west coast connections from the German border to Endrup is scheduled to come online in the first quarter of 2025.

Once up and running at full tilt, Viking Link will operate at ±525 kV DC and will allow up to 1.4 GW of power to be transferred between the UK and Denmark, passing through the UK, Dutch, German and Danish waters, using single-core, mass-impregnated paper-insulated cables. This project, stretching 765 km subsea and onshore connecting from Bicker Fen in Lincolnshire, UK, and Revsing in South Jutland, Denmark to enable clean energy to be shared, is a joint venture between National Grid Ventures, part of National Grid, and Denmark's Energinet.

Offshore Energy
http://www.offshore-energy.biz/

19 December 2023

Suomen Voima launches new pumped storage project in Finland

Suomen Voima has announced details of a new energy storage venture named 'Noste' in the Kemijärvi region of Finland. The ambitious project involves the construction of 1-3 small-scale pumped-storage hydropower plants in Northern Finland, aimed at bolstering the country's green transition and enhancing energy balance. The estimated investment for this venture is set to reach up to €300 million.

The surge in wind and solar power, although pivotal for clean energy, comes with significant production variability. To address this challenge, Suomen Voima's Noste project will introduce pumped-storage hydropower plants, a proven solution across Europe. While this form of energy production is relatively unfamiliar in Finland, there is a substantial demand for efficient energy storage solutions. Noste is anticipated to contribute 100-200MWof balancing power, providing a crucial element for Finland's move towards sustainable energy infrastructure. Each hydropower plant within the project is estimated to cost between €50-100 million, culminating in a total investment of up to €300 million.The project aims to employ state-of-the-art technology, with a paramount focus on designing pumped storage facilities that minimize their impact on the northern environment and landscape. Suomen Voima said it is committed to reducing any adverse effects on residential and recreational areas.

Beyond its environmental benefits, the Noste project is set to have significant local and regional economic impacts. The investment is expected to spur positive developments in employment, tax revenues, and rental income during both the construction and operational phases. The first hydropower plant is slated to commence operations within the

current decade.Suomen Voima has initiated negotiations with landowners and said it is committed to maintaining an open dialogue with residents, businesses, and other local stakeholders to ensure a seamless collaboration during the project preparation phase.

International Water Power
http://www.waterpowermagazine.com/

19 December 2023

Energy prices and security of supply: Council agrees to extend emergency measures

Today ministers reached a political agreement on extending the period of application of three emergency Council regulations adopted under article 122 of the Treaty on the Functioning of the EU, designed for emergency situations.

The emergency measures were adopted last in order to enhance solidarity between member states, accelerate the deployment of renewable energy and protect EU citizens from excessively high energy prices. Regulation (EU) 2022/2576 enhancing solidarity through better coordination of gas purchases, reliable price benchmarks and exchanges of gas across borders includes temporary emergency measures designed to bring down high energy prices and improve gas supply security. Ministers agreed to delete article 10 on mandatory participation in demand aggregation. The emergency regulation applies from 30 December 2022 for a period of one year. EU energy ministers agreed to extend the regulation for one more year, until 31 December 2024. Regulation (EU) 2022/2577 laying down a framework to accelerate the deployment of renewable energy aims to tackle the energy crisis and further advance the EU's climate objectives by accelerating the permit-granting process for and the deployment of renewable energy projects.

The regulation applies from 30 December 2022 for a period of 18 months. Ministers agreed to extend the period of application of certain amended provisions of the regulation until 30 June 2025. Regulation (EU) 2022/2578 establishing a market correction mechanism to protect EU citizens and the economy against excessively high prices establishes a system of temporary measures to prevent spikes of excessively high gas prices in the EU that do not reflect prices on the world market. Ministers agreed to prolong the period of application of the regulation, as proposed by the Commission, and they maintained its substance. The regulation applies from 1 February 2023 for a period of one year and it will be extended for one more year, until 31 January 2025. The Council will now aim to formally adopt the regulations by written procedure. They will then be published in the EU's Official Journal and enter into force immediately after the expiration of the current regulations.

EU
http:/ec.europa.eu/

19 December 2023

Commission, Baltic States and Poland commit to accelerated Baltic grid synchronization with Continental Europe

Today, the European Commission and representatives of the governments of Estonia, Latvia, Lithuania and Poland signed a Political Declaration confirming their commitment to proceed at full speed to connect the electricity networks of the three Baltic States with continental Europe, via Poland, by February 2025. This is almost a year earlier than the previous deadline of end of 2025.

The three Baltic States are the last remaining EU Member States with electricity networks that are still synchronised with Russia and Belarus. Their synchronisation is a strategic project of common interest. Over the past 12 years, it has received significant political, technical, and financial EU support exceeding EUR 1.2 bn worth of grants. Under the political declaration, the Member States concerned also committed to speeding up the

development of the 'Harmony Link Interconnector', one of the most significant energy infrastructure projects between Lithuania and Poland.

Commissioner for Energy, Kadri Simson, said: 'We are approaching the historic moment of full integration of Estonia, Latvia and Lithuania into our internal electricity market, to be achieved with the synchronisation of Baltic and Continental European power grids by February 2025. This synchronisation project will enable the three Baltic States to gain full control of their electricity networks, and reinforce energy security in the region. Today's joint political declaration with the Baltic States and Poland will guarantee the delivery of the final stages of the project. Most notably, we have endorsed an alternative onshore design of the Harmony Link interconnector, adding security and resilience to the grid, while avoiding cost over-runs and delays in buildout. Today's declaration confirms our solidarity at a time when war continues to rage on Europe's borders.'

EU
http:/ec.europa.eu/

19 December 2023

ACWA signs PPA with South African state for 1.2GWh hybrid project

Saudi-based independent power producer (IPP) ACWA Power has signed a PPA with government bodies in South Africa for a solar-plus-storage project with a 1,200MWh BESS. ACWA announced the signing on an implementation agreement and a power purchase agreement (PPA) for its Project DAO yesterday (18 December). The project combines 442MW of PV with a 1,200MWh battery energy storage system (BESS) and is scheduled to come online in the second quarter of 2026.

The announcement said the project will have '150MW of dispatchable power', which may indicate either the terms of the PPA or the power rating of the BESS. The Minister of Mineral Resources and Energy of South Africa, Gwede Mantashe, signed the implementation agreement while Segomoco Scheppers, senior general manager at transmission system operator (TSO) Eskom, signed the PPA. Project DAO was declared as one of the preferred bidders in the Risk Mitigation IPP Procurement Program (RMIPPPP) in 2021. Another project from that, a solar plus 1,440MWh BESS unit from Norway-headquartered IPP Scatec, started operations recently. Two from EDF Renewables, wind-plus-storage and solar-plus-storage projects, are set to come online in 2025.

French energy giant TotalEnergies has started construction on a solar-plus-storage project in South Africa, with a power generation capacity of 216MW and a battery output of 75MW/500MWh. The project, in the country's Northern Cape province, is owned by three companies: TotalEnergies and Hydra Storage Holding, both of which hold a 35% stake in the project, and Reatile Renewables, which owns the remaining 30%. The developers have signed a 20-year power purchase agreement with South African national utility Eskom to acquire power generated at the project, and TotalEnergies and its partners expect to commission the facility in 2025. hile none of the companies involved announced technological specifications for the project, its leaders expressed optimism about the benefits of the combination of solar and storage functions at the project.

Energy-Storage
http://www.energy-storage.news/

22 December 2023

Tesla moves forward with a plan to build an energy-storage battery factory in China

American electric automaker Tesla's plans to produce energy-storage batteries in China moved forward on Friday with a signing ceremony for the land acquisition for a new factory in Shanghai, China's state media said.

Construction is scheduled to start early next year with production to come on line by the end of the year, the official Xinhua News Agency said. The factory won't build batteries for cars but for electric utilities and other companies to store power. Such storage units have become increasingly important with the growth in solar power and wind energy, which only generate electricity when weather conditions are favorable and need to store it for when residential and commercial users need it. The new factory will initially produce 10,000 of Tesla's Megapack units annually for sale worldwide. The Tesla project is a rare piece of good news for the Chinese economy, which has seen a sharp drop in foreign investment this year.

The Commerce Ministry said this week that foreign investment in the first 11 months of this year was down 10% compared with the same period last year. Foreign companies are worried about the Chinese government's increasing control over business on national security and other grounds, as well as growing U.S. restrictions on technology trade with China. China is a major market and manufacturing center for Tesla, and the company's CEO, Elon Musk, has built close ties with Chinese officials even as U.S.-China relations soured. In May, he met the commerce minister and the then foreign minister in Beijing. Tesla built an electric vehicle plant in Shanghai in 2019 that assembles cars for China, Europe and other overseas markets. It is the No. 2 seller in the booming Chinese market for electric vehicles. The market leader is Chinese auto company BYD, which announced plans Friday to build electric vehicles in Hungary in what will be its first car factory in Europe. Tesla sold 464,654 vehicles in China in the first 10 months of the year, up 37.5% over last year and accounting for 12% of China's electric vehicle sales, according to the China Passenger Car Association, the research arm of the China Automobile Dealers Association.

AP News
http://apnews.com/

22 December 2023

China: renewable energy now exceeds 50% of installed capacity

China's installed capacity of renewable energy has exceeded 1.45 billion kilowatts this year, accounting for more than 50 percent of the country's total installed power generation capacity, according to data released by the National Energy Administration. Renewable energy has become a new force to ensure electricity supply in China in 2023 amid the country's green energy transition, it said. China has been accelerating the pace of green and low-carbon energy transformation in 2023, with installed capacity for wind and solar exceeding one billion kilowatts, playing a more than ever important role in newly installed power capacity in the country, said the administration. China has been stepping up efforts in construction of its renewable energy power base in the country's Gobi Desert and other arid regions. By the end of November, the first batch has been completed and connected to the grid, with a total capacity of 45.16 million kilowatts. The second and third batches, totaling over 50 million kilowatts, have been approved and are currently under construction, it said.

China Daily
http://global.chinadaily.com.cn/

22 December 2023

German grid agency sees need for back-up coal power plants until March 2031

Germany's energy regulator BNetzA has said that several coal power plants should remain as a reserve until the end of March 2031 to ensure grid stability in times of need, reports Die Welt. The plants would only act as a reserve when called upon by grid operators, and "they will only run rarely and therefore have no noticeable impact on our carbon

footprint," a spokesperson for the agency told the newspaper. "The intention is still that no coal-fired power plant will be active on the market after 2030." Several grid operators had called for keeping the plants as backup longer than planned, writes Die Welt. "This is necessary to ensure system stability today and in the years to come," a spokesperson for grid operator TransnetBW said.

The German government intends to pull forward the coal exit in Germany to 2030, from the current official target of 2038 at the latest. However, state governments in eastern Germany have repeatedly voiced their concerns about an earlier exit, or even rejected it outright. They argue that this could undermine supply security. Whether the federal government's "ideal" phase-out schedule can be kept will for example depend on the pace of renewable power and grid expansion, as well as the planned construction of new gas power plants. The economy ministry plans to publish a long-delayed evaluation of the coal phase-out's progress and prospects soon.

Clean Energy Wire
http://www.cleanenergywire.org/

22 December 2023

European Commission approves €17.7bn Italian initiative for electricity storage

The European Commission, in accordance with EU State aid regulations, has given its approval to a €17.7bn Italian initiative aimed at facilitating the establishment and functioning of a centralized electricity storage system. This initiative aligns with the goals of the European Green Deal and the 'Fit for 55' package, as it plays a crucial role in fostering the incorporation of renewable energy sources into the Italian electricity grid. Italy's proposed scheme involves supporting the development of electricity storage facilities, collectively possessing a capacity exceeding 9 GW/71 GWh. This initiative is slated to remain in effect until 31 December 2033.

The primary objective of this measure is to streamline the integration of renewable energy sources (RES) into the Italian electricity grid. Given that RES electricity generation may not always align with periods of peak demand, the implementation of electricity storage systems becomes crucial. These systems enable the storage of surplus electricity during times of overgeneration, making it available during periods of scarcity. Consequently, this approach helps mitigate RES curtailment and reduces the necessity for additional electricity production from programmable yet environmentally detrimental power plants, such as fossil fuel-fired facilities.

Within this scheme, financial assistance will be provided in the form of annual payments to cover both the investment and operating expenses incurred by electricity storage developers. The selection of beneficiaries will occur through a competitive, transparent, and non-discriminatory bidding process. In this process, electricity storage developers will vie for support by submitting offers based on the lowest requested aid per offered capacity volume. This initiative is open to all technologies that meet the performance criteria established by the Italian Transmission System Operator (TSO) and endorsed by the Italian Energy Regulator. The roster of eligible electricity storage technologies will undergo a biennial review to incorporate advancements in technology. Presently, qualifying technologies include electrochemical lithium-ion storage and hydro pumped storage plants.

As an integral component of this initiative, the establishment of a novel "time-shifting trading platform" is envisioned. This platform will aggregate storage capacity, presenting it to external entities in the shape of standardized time-shifting products. Those benefiting from the measure will be mandated to contribute their storage assets to this platform. The Transmission System Operator (TSO) will subsequently allocate physical storage assets to fulfill standard time-shifting contracts, thereby optimizing the utilization of available storage

resources. This innovative platform will empower renewable energy source (RES) producers to leverage the supported storage assets, enabling them to directly transition their electricity production from periods of surplus to periods of scarcity.

The Commission conducted an evaluation of the scheme in accordance with EU State aid regulations, specifically scrutinizing Article 107(3)(c) of the Treaty on the Functioning of the European Union (TFEU). This article allows Member States to provide support for the advancement of specific economic activities, subject to specific conditions. Additionally, the assessment considered the 2022 Guidelines on State aid for climate, environmental protection, and energy (CEEAG). These guidelines provide a framework for evaluating state aid measures in the context of climate, environmental protection, and energy objectives. The Commission's evaluation yielded the following findings:

- The measure effectively fosters the development of an economic activity, specifically in the realm of electricity storage plants. Moreover, the scheme is deemed essential and appropriate for expediting investments in electricity storage. Simultaneously, it aligns with the objectives of key EU policy initiatives, including the European Green Deal and the 'Fit for 55' package.
- The scheme is deemed proportionate, with the level of aid corresponding to the actual financing requirements. Adequate safeguards, such as a competitive bidding process for aid allocation, will be implemented to restrict aid to the minimum necessary.
- The aid exhibits an incentive effect, as the supported storage facilities would not be financially viable without public support.
- The positive effects resulting from the aid outweigh any potential distortions in competition and trade within the EU.

Based on these conclusions, the Commission has granted approval to the Italian scheme in accordance with EU State aid regulations.

NS Energy
http://www.nsenergybusiness.com/

25 December 2023

'World's first' 35kV superconducting power cable tested, claims China

Engineers have officially powered up a 35 kV transmission capacity superconducting cable in Shanghai, China. Reaching its full-load capacity during a test, this, China.org.cn claims, is the world's longest kilometer-level superconducting cable. The cable, which is 3/4-mile (1.2 km) in length, is unique in that it has been put into operation in an urban core and installed entirely in ducts. This makes it, Chinese sources claim, to be the only cable of its kind globally.

Superconducting power transmission cables use superconductivity to transmit electricity with almost no losses. The principle of superconducting materials is to reduce the resistance of power transmission to almost zero in low-temperature liquid nitrogen. One superconducting cable can transmit the same amount of power as four to six conventional cables at the same voltage level, thus saving about 70 percent of underground pipe space.

The quoted cable voltage is towards the higher end of medium voltage ranges for urban and semi-urban applications. Superconducting cables in this range might operate at 15 kV, 25 kV, or 35 kV. This range is typical for distribution networks. Cities like Shanghai primarily use superconducting cables for their distribution networks. This range is suitable for the density and power needs of urban areas. But, what is unique about this cable is its length and duct installation.

The new demonstration project spans 3 quarters of a mile (1.2 km) between two 220 kV substations in Xuhui District, central Shanghai. Its design current is 2,200 amperes. The cable is "the result of two decades of efforts by engineers at Shanghai Electric Cable

Research Institute (SECRI) under Shenergy Group, an enterprise which has specialized in electric cable over the past 60 years and which spearheads the superconducting transmission industry".

"If superconducting cables are widely used, the problems of high electricity density and limited space in super-large cities like Shanghai can be solved," said Huang Chongqi, a member of the Chinese Academy of Engineering and an expert in superconducting cables. The Shanghai Electric Cable Research Institute (SECRI) team believes that independent innovation is essential for pioneering this frontier industry. "Our self-design helped reduce the cost of superconducting raw materials, once monopolized by foreign countries, by nearly two-thirds," said Huang, a senior SECRI engineer.

"The detection and isolation of weak electric signals in the superconducting cable system was a world-class technical challenge. SECRI engineers worked independently to acquire key test data, which effectively enhanced their standard-setting capability at the world's first international standard conference for superconducting cables," explained China.org.cn. In September 2022, the National Development and Reform Commission released data stating that China has constructed the largest power system in the world. The transmission line length above 35 kV in China now spans 1.4 million miles (2.26 million kilometers), equivalent to circling the Earth 56 times.

The 3/4-mile (1.2 km) power line in Shanghai is exceptional but serves as a good starting point for the development of 3-mile (5 km) and 6-mile (10 km) cables, according to Huang. "We used to import all the high-voltage cables, but then the homegrown ones started catching up," said Zong Xihua, a deputy chief engineer of SECRI. "Now, we have made an early start in superconducting power transmission technology and taken the lead globally thanks to two decades of research and development efforts," he added.

Interesting Engineering
http://interestingengineering.com/

27 December 2023

Japan lifts operational ban on world's biggest nuclear plant

Japan's nuclear power regulator on Wednesday lifted an operational ban imposed on Tokyo Electric Power's Kashiwazaki-Kariwa nuclear power plant two years ago, allowing it to work towards gaining local permission to restart.

Tepco has been eager to bring the world's largest atomic power plant back online to slash operating costs, but a resumption still needs consent from the local governments of Niigata prefecture, Kashiwazaki city and Kariwa village, where it is located. When that might happen is unknown. With capacity of 8,212 megawatts (MW), the plant has been offline since 2012 after the Fukushima disaster a year earlier led to the shutdown of all nuclear power plants in Japan at the time.

In 2021, the Nuclear Regulation Authority (NRA) barred Tepco from operating Kashiwazaki-Kariwa, its only operable atomic power station, due to safety breaches including the failure to protect nuclear materials and missteps that saw an unauthorized staff member accessing sensitive areas of the plant. Citing improvements in the safety management system, the NRA on Wednesday lifted a corrective action order that had prevented Tepco from transporting new uranium fuel to the plant or loading fuel rods into its reactors - effectively blocking a resumption.

Following the decision, Tepco said it would continue its efforts to regain the trust of the local community and society at large, while Japan's chief cabinet secretary said the government would do its part to aid the process. "The government will seek the understanding and cooperation of Niigata prefecture and local communities, emphasizing 'safety-first'," Yoshimasa Hayashi, the government's top spokesperson, said.

Resources-poor Japan is eager to bring more of its nuclear power plants online to reduce its reliance on imported fossil fuels such as liquefied natural gas (LNG). The Institute of Energy Economics, Japan (IEEJ) forecast last week that Japan's LNG imports would decline to 58.5 million metric tons in the 2024/25 fiscal year from an estimated 64 million tons this year. The fall factors in the anticipated restarts of a few more nuclear reactors and an increase in renewable energy sources. Shares in Tepco had soared after the NRA indicated early this month that it would consider lifting the operational ban after conducting an on-site inspection and meeting with the company's president.

Reuters
http://www.reuters.com/

27 December 2023

India, Russia Sign Deal for Future Units at Nuclear Power Plant

India said on Tuesday it had signed agreements with Russia for future units of the Kudankulam Nuclear Power Project in the southern state of Tamil Nadu. Foreign minister Subrahmanyam Jaishankar, who is on a visit to Russia, is expected to hold talks with his Russian counterpart Sergei Lavrov on Wednesday, and the two ministers plan to discuss bilateral ties.

"Today, in the presence of Deputy Prime Minister Denis Manturov, we signed some important agreements pertaining to future units of the Kudankulam Nuclear Project," Jaishankar said at a gathering with the Indian community in Moscow on Tuesday. Construction of the first two units began nearly two decades ago as part of a project signed by both countries.

Reuters
http://www.reuters.com/

28 December 2023

Brazil grows 8.4 GW of installed energy capacity in 2023

Brazil expanded its installed capacity of electrical energy by 8.4 gigawatts (GW) in 2023, and new plants from renewable wind and solar sources correspond to 90.4% of the growth, the Ministry of Mines and Energy reported this Tuesday.

According to the ministry, the Brazilian electricity matrix reached 196.6 GW at the end of this year, with renewable generation sources (hydraulic, wind, photovoltaic and biomass thermal) representing 83.6% of the total. In the ranking of the States with the greatest participation in the expansion, Rio Grande do Norte, Minas Gerais and Bahia stood out, with around 2 gigawatts (GW) of new power added in each.

The strong growth of renewable energies in the Northeast and in Minas Gerais, mainly in the State for photovoltaic solar sources, has led the country to reinforce its energy transmission network to the load centers of the Southeast and the South. After a battery of transmission auctions between this year and March 2024, with the offer of projects for a total of more than 50 billion raise in investments, the government evaluates the need for a new transmission bipole to flow the energy, a venture that could be auctioned in 2025 or 2026.

Another aspect that continued to grow rapidly this year was distributed micro and mini generation, solar plants of up to 5 MW installed on roofs, facades and land that meet the locality’s own energy consumption. According to the ministry, the self-generation modality of photovoltaic energy reached 24.4 GW of installed capacity in 2023, already representing around 11% of the country’s electricity generation.

EV Wind
http://www.evwind.es/