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WEEKLY EDITION

## Initial Lunar Landing Plan Unveiled

By Staff Reporters

China plans to land on the moon and conduct scientific expedition before 2030, followed by the construction of a lunar scientific experiment station, which will carry out systematic, continuous lunar exploration and experiments, along with verification of corresponding technologies, said Zhang Hailian, deputy chief designer with the China Manned Space Agency (CMSA), at a mid-July forum in Wuhan, central China's Hubei province.

According to the preliminary plan of China's lunar landing introduced by Zhang, there will be two craft, a lunar lander and a manned spacecraft, which will be sent into the lunar orbit separately by two carrier rockets. The two will then conduct rendezvous and docking maneuvers, allowing astronauts to enter the lunar lander from the spacecraft.

The lunar lander plans to land on a designated area of the lunar surface. The astronauts will conduct scientific expeditions and collect samples in the area.

When the tasks are done, the astronauts will return to the lunar orbit in the lander, which will dock with the spacecraft. The astronauts then move into the spacecraft with lunar samples and return to Earth.

To make this process happen, researchers are now working on the development of equipment, including the Long March-10 carrier rocket, a new-generation manned spacecraft, the lunar lander and a manned lunar rover, said Zhang.

The Long March-10 carrier rocket has a 3.5-level structure and a diameter of five meters, with a carrying capacity of 27 tons on the trans-lunar injection orbit. The new-generation manned spacecraft has a modular design, consisting of an escape tower, a re-entry capsule and a service capsule, which could be adapted to both near-earth and deep-space tasks.

Meanwhile, the lunar lander is made up of a lander module and a propelling module, being able to send two astronauts to the lunar surface. The 200kg manned lunar rover can also carry two astronauts.

Additionally, researchers are researching moon landing spacesuits, which could operate for eight hours. The spacesuits should have abilities to support astronauts in their walking, climbing and driving during extravehicular activities.



Ningxia Lavender Manor in recent years through the improvement of desert land transformed deserts into a sea of flowers in today's oasis, showcasing an example of ecological development. (PHOTO: XINHUA)

## Editor's Pick

### China's First Offshore Carbon Storage Project Goes Live

By Staff Reporters

About 200 kilometers southwest of Shenzhen, China's first offshore carbon storage project is operating on the Enping 15-1, the largest offshore crude oil production platform in Asia. The project is designed to store 1.5 million tons of carbon dioxide (CO<sub>2</sub>) from the platform's full life cycle, according to the China National Offshore Oil Corporation (CNOOC).

#### Natural storeroom

Associated gas is usually found in the drilling and development of crude oil, and CO<sub>2</sub> accounts for 20 to 30 percent of the gas. As for Enping 15-1 oilfield, the "gas cap" above the oil in the reservoir has a very high carbon dioxide content.

It is estimated that the oilfield will produce about 1.5 million tons of CO<sub>2</sub> during its full life cycle, said Mi Lijun, director of the CNOOC Research Institute, adding that without intervention, the CO<sub>2</sub> can escape

during crude oil production, which will cause corrosion of the offshore platform facilities and submarine pipelines, as well as increase China's CO<sub>2</sub> emissions. Therefore, engineers try to capture these CO<sub>2</sub> emissions and inject them deep into the seabed to where they can be permanently stored.

The first step is to find a suitable "storeroom". About 3 kilometers from the Enping 15-1 platform and 800 meters below the seabed, technicians found a "dome-like" geological structure. See page 4

## China Sees Surge in Shipbuilding Industry

By LU Zijian

China has sailed into the global top spot in terms of output, new orders and holding orders of its shipbuilding industry for the first half of 2023, according to data released by the Ministry of Industry and Information Technology.

Calculated by Deadweight Tonnage (DWT), the shipbuilding output reached 21.13 million tons from January to June, increasing by 14.2 percent year-on-year and making up 49.6 percent of the global total tonnage; the new orders hit 37.67 million tons, surging by 67.7 percent compared to that of last year and accounting for 72.6 percent of the world's total. Meanwhile, by the end of June, the holding orders had risen to 123.77 million tons with an increase of 20.5 percent year-on-year, comprising 53.2 percent of the global total holding orders.

When calculated by Compensated Gross Tonnage (CGT), the output, new orders and holding orders of China's shipbuilding industry accounted for 47.3 percent, 67.2 percent and 46.8 percent of the global total respectively.

The country has also demonstrated its ability to construct high-tech vessels like cruise ships, liquefied natural gas (LNG) vessels and aircraft carriers, which are regarded as the three diamonds in the crown of global ship building.

Not so long ago, China's first domestically built large cruise ship Adora Magic City completed its undocking and transition to the dock mooring debugging stage in Shanghai. The Dapeng Princess, the world's largest fourth-generation LNG vessel to sail in shallow water channels, was delivered in February. The country's third aircraft carrier, the Fujian, was launched in Shanghai in June 2022.

In addition, building green ships is a key feature of China's shipbuilding industry. By the end of June, the number of green ships accounted for more than 90 percent of the total orders of Hudong-Zhonghua Shipbuilding (Group) Co., Ltd and Jiangnan Shipyard under China Shipbuilding Group Corporation. A container ship made by Hudong-Zhonghua is powered by both fossil fuels and LNG, which lowers over 28 percent of green house gas emissions.

## WEEKLY REVIEW

### China's Solar Telescope Array Begins Trial Operation

A circular array solar radio imaging telescope that sits in Daocheng County, Sichuan province, started the scientific trial observation on July 14, according to its developer, the National Space Science Center of the Chinese Academy of Sciences.

### AI Model Serves Accurate Global Weather Forecasts

Researchers from Huawei Cloud have developed an AI-based model with three-dimensional neural networks for accurate and medium-term global weather forecasts, according to a recent research in the journal *Nature*.

### New Superconductor Material with High Transition Temperature

Chinese scientists have discovered a maximum transition temperature of 80 K (-193°C) in single crystals of La<sub>2</sub>NiO<sub>7</sub> under high pressure, marking a breakthrough in the search for more easily accessible superconductors. The study was published recently in the journal *Nature*.

### New Imaging Biomarker for Parkinson's Disease

Chinese researchers have developed an imaging biomarker for Parkinson's disease (PD) that will be reliable for early diagnosis and drug development, according to a recent study published in the journal *Cell*.

## Japan's Ocean Discharge Plan to Have Unpredictable Impact

By WANG Xiaoxia

Next month, Japan will start to discharge more than a million tons of nuclear-contaminated water from the Fukushima Daiichi Nuclear Power Station, which suffered a meltdown due to an earthquake and tsunami in 2011, into the Pacific Ocean. It is unprecedented in the history of the nuclear industry and will bring long-term and unpredictable consequences, scientists and researchers said at a seminar organized by China Association for Science and Technology in Beijing on July 18.

By WANG Xiaoxia

The International Atomic Energy Agency (IAEA) recently said Japan's plan to discharge the "treated" contaminated water into the ocean is consistent with IAEA safety standards. This will undoubtedly embolden Japan to press ahead with the plan despite the objections of neighboring regions, although IAEA Director General Rafael Mariano Grossi has said that the report is neither a recommendation nor an endorsement of the discharge policy.

#### "Treated water"?

Japan's ocean discharge plan is largely limited and incomplete, and its so-called "treated water" should be questioned.

The contaminated water produced by a nuclear accident is different from the wastewater produced by normal nuclear station operations. It contains more powerful and complex radionuclides, said Liu Xinhua, chief expert at the Nuclear and Radiation Safety Center of the Ministry of Ecology and Environment (MEE). See page 4



Photo shows people protesting against Japan's nuclear wastewater discharge plan in Seoul, South Korea, July 8, 2023. (PHOTO: XINHUA)

## Opinion: Spilled Water Can Never Be Retrieved

By LIANG Yilian

Japan's plan to release "treated water" into the sea at Fukushima, scheduled to begin in mid-August, entails significant risks and uncertainties, making it a matter of global concern.

Although safety tests have been conducted, they are not definitive, all the more so since the planned action is unprecedented. Compared to the discovery of antibiotics in the early 20th century, while considered groundbreaking at the time, their subsequent widespread use led to antibiotic resistance and adverse impact on human health.

Similarly, Japan's decision to dump nuclear-contaminated water into the ocean lacks sufficient supporting data and case

studies to ensure its long-term safety, and the discharge will mark the beginning of another potential crisis.

The international community is monitoring Japan's actions. Hundreds of people in South Korea, including members of the Korean Confederation of Trade Unions, took to the streets on July 8 to protest against the plan, *The Guardian* reported.

The Hong Kong environment chief has said seafood from the high-risk regions near Fukushima will be banned in the special administrative region if Japan proceeds with the discharge, indicating the serious concerns of neighboring regions.

This decision also poses a considerable threat to Japan itself, jeopardizing years of efforts to rebuild the reputation of its nuclear industry following the Fukushima disaster caused by a tsunami in 2011.

A recent opinion poll in Japan found that 80.3 percent of the respondents think the authorities have not adequately explained the discharge plan. Also, over 87.4 percent believe that it will harm Japan's image, *Kyodo News* reported. This feedback highlights the lack of transparency and communication surrounding the decision.

Discharging the nuclear-contaminated water into the sea can't be the only option. Regrettably, Japan has not fully explored alternative technological solutions, thus failing to show itself to be a responsible nation. Instead, it has opted for the reckless path driven by short-term economic interests.

This short-sighted decision will have long-term consequences and set a dangerous precedent. While many nations have expressed opposition to Japan's plan, it is disconcerting that some Western countries have remained silent. It is important to reflect on history and remember the despised policy of appeasement adopted by Arthur Neville Chamberlain, the British Prime Minister before the Second World War, who made compromises at the expense of other nations. Those who choose to turn a blind eye to Japan's action now may ultimately face similar consequences.

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We cannot afford to repeat past mistakes. It is imperative that we stand up for the well-being of all, ensuring the safety and sustainability of our shared future. Therefore, every following action Japan takes on the discharge should be subject to global scrutiny.

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