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TRANSLATIONS

A New Pillar for Distant Oceans: Concepts for the Chinese Navy's New Generation of General-Purpose Destroyers

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A New Pillar for Distant Oceans

Concepts for the Chinese Navy's New Generation of General-Purpose Destroyers[1]

TianYing

A recent unconfirmed rumor about the Chinese Navy developing a new general-purpose guided-missile destroyer has stirred debate online. Many commenters argue that the Type 055 already offers exceptional capability across air defense, missile defense, anti-ship, anti-submarine, and general warfare roles, and is more than capable of meeting current mission needs. But because it's expensive to build, it is not practical to produce in large numbers or to use for routine tasks, so it will likely remain a smaller part of the fleet. In contrast, the more affordable Type 052D class is limited by its size and displacement, which restricts how much it can be upgraded. As a result, it still cannot match the endurance or sustained firepower of the U.S. Navy's *Arleigh Burke*-class destroyers.

Given the high reliance of various national industries on overseas resources, energy, and markets, effectively safeguarding the nation's overseas interests has become a crucial mission for the Chinese Navy. This suggests that the Chinese Navy is preparing to operate farther from home waters. But the Type 052D's limited endurance and sustained firepower become more obvious on long-distance deployments. As a result, the Chinese Navy now needs a new general-purpose destroyer with a displacement between that of the 10,000-ton Type 055 and the smaller Type 052D. The goal would be to achieve much better blue-water performance than the 052D while keeping costs well below those of the Type 055.

Naval equipment and combat capabilities evolve based on operational needs and advances in modern technology. Rapid progress across high-tech fields is giving the Navy the foundation to move into a new stage of development. China now has a mature research base, an extensive industrial system, and solid production capabilities, and its sustained economic growth provides

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[1] 天鹰 [Tian Ying], 远洋新砥柱—中国新一代通用驱逐舰构想 ["A New Pillar for Distant Oceans: Concepts for the Chinese Navy's New Generation of General-Purpose Destroyers"], 舰载武器 [*Shipborne Weapons*], (July 2025), pp. 32-39.

Translator's Note: *Shipborne Weapons* is a magazine published by the China State Shipbuilding Corporation's Zhengzhou Electromechanical Institute (中国船舶集团 郑州机电工程研究所), which is involved in the Chinese naval shipbuilding industry. "Tian Ying" is a pseudonym.

the resources needed to continue modernizing its naval forces. Given the long-term need to conduct far-seas protection and other blue-water missions, it is reasonable to expect the Chinese Navy to pursue a new generation of general-purpose surface combatants with greater endurance and improved overall capability.

Chinese Navy's Type 052D destroyer *Zhanjiang*

----------p. 33 begins----------


The 130mm main gun of a Chinese Navy Type 052D destroyer conducting a firing drill

The Rationale for the Chinese Navy to Develop a New Generation of General-Purpose Destroyer

As is widely known, among the Chinese Navy's current active surface combatants, guided-missile destroyers are the main combat equipment with the strongest comprehensive combat capability. Among these, the Type 055 and the Type 052D classes of guided-missile destroyers are the principal models. With a full displacement of 13,000 tons, the Type 055 guided-missile destroyer is the Chinese Navy's first large surface warship in the 10,000-ton class. It possesses advanced radar and electronic systems, a high level of informatization and automation, and

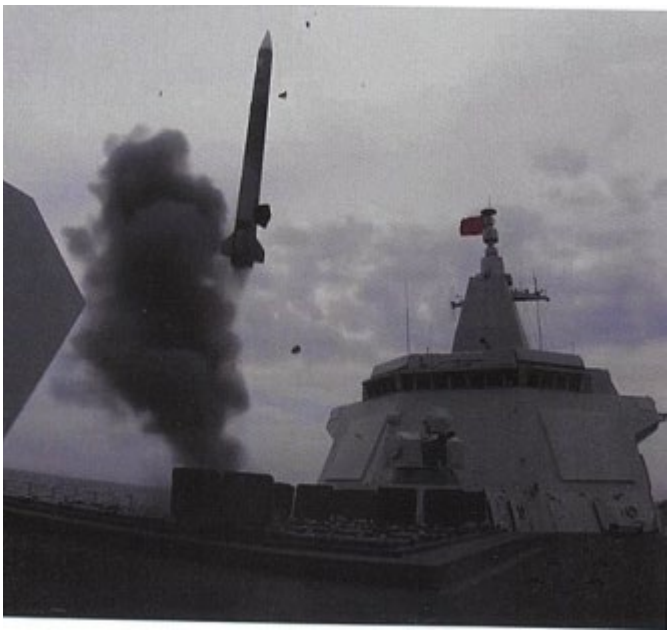
unprecedentedly powerful capabilities for air defense, anti-missile, anti-ship, anti-submarine, and multi-role combat. Not only is it in a leading position among comparable warships globally, but it is even said to be driving the development trend of surface ships in the world today. In foreign naval equipment statistics, it is often classified as a cruiser, which largely reflects the outside world's assessment of its powerful combat capabilities.

As of now, the Chinese Navy has completed (or is about to commission) ten Type 055 guided-missile destroyers. Commercial satellite images show that at least four more are under construction on the slipways. After the first batch of Type 055 destroyers entered service, they primarily served as a critical component of aircraft carrier formations, or as the core vessel in surface action groups and comprehensive mobile naval formations, for long-term deployment and continuous mission execution at sea. With the addition of the Type 055 destroyer, which possesses powerful long-range strike and comprehensive defensive capabilities, to the Chinese Navy's aircraft carrier formations, the PLAN has formed a completely new modern maritime combat system. The Type 055, equipped with weapons such as the "Yingji-21" (YJ-21) hypersonic anti-ship ballistic missile and advanced defensive systems, is capable of executing ultra-long-range devastating strikes against an enemy's aircraft carrier platform from outside the combat radius of the foreign military's carrier-borne aircraft. At the same time, the PLAN's own carrier-borne aircraft can effectively compensate for the Type 055 destroyer's relative shortcoming in outer-layer air defense. Together with Type 055 and other escort warships, they form a deep, multi-layered air defense system (long-range, medium-range, and close-range), thereby becoming a reliable guarantee for the Type 055 and the aircraft carrier to maximize their combat power.

Of course, the large, state-of-the-art destroyer inevitably has a drawback: the construction and maintenance costs are extremely high. Furthermore, judging by the system composition of the Chinese Navy's aircraft carrier formations, it is neither possible nor necessary for the escort force to be entirely composed of 10,000-ton Type 055 destroyers. Generally, a carrier group mainly includes one aircraft carrier, two Type 055 destroyers, 2–4 other combat ships with relatively strong anti-air and anti-submarine capabilities, and a comprehensive supply ship. Therefore, it is expected that the demand is low for the Type 055 class of surface combatants, based on the service numbers and composition of the Chinese Navy's aircraft carrier platforms.

Another important application of the Type 055 destroyer is to serve as the core platform for non-carrier naval formations and comprehensive at-sea task groups, executing modern maritime strategic, campaign, and tactical missions. Based on the expected needs for near seas defense and far seas protection missions, the demand for task groups without aircraft carriers is likely to remain for the foreseeable future. Therefore, there is no pressing need for the Type 055 destroyer, as a core platform for such formations, to be built and equipped on a massive scale. Additionally, with continuous technological advancement, the future Chinese Navy may develop even more

The bow of the Chinese Navy Type 055 Destroyer *Nanchang* (Hull Number 101)



The Chinese Navy Type 055 destroyer *Nanchang* launches an "HQ-9" Surface-to-Air Missile

----------p. 34 begins----------

advanced and comprehensively capable large surface warships. Consequently, most military observers believe that the Type 055 destroyer (including its future variants), as a high-end piece of equipment, will likely maintain a relatively low proportion within the overall structure of Chinese naval vessel equipment for the long term.

In contrast, the number of Type 052D series destroyers in service has exceeded 30 hulls, making it the guided-missile destroyer with the largest number built and equipped by the Chinese Navy

as presently constituted. Equipped with a large shipborne phased-array radar and a new domestic missile Vertical Launching System (VLS), the Type 052D destroyer's overall combat capability is comparable to that of the U.S. Navy's active mainstay, the *Arleigh Burke*-class Aegis warship. Furthermore, due to the advantage of being a later-generation design, it even holds some advantages in the performance of its radar detection equipment and certain combat weapons. Consequently, the Type 052D destroyer must not only undertake the Chinese Navy's main escort missions for aircraft carriers and amphibious assault ships but also carry out missile strike missions against enemy targets at remote distances. Other mission roles include using long-range cruise missiles to destroy important enemy land facilities, providing fire support for amphibious landing operations, safeguarding sea lines of communication, and anti-submarine warfare. However, it should also be noted that the tonnage and number of VLS cells of the Type 052D still show a significant gap compared to the U.S. Navy's *Arleigh Burke*-class. This results in a prominent deficiency in endurance and, particularly, sustained firepower. The combined number of VLS cells on three Type 052D destroyers is only roughly equivalent to that of two *Arleigh Burke*-class destroyers. This means that when executing missions of the same nature, a larger number of Type 052D destroyers must be deployed to achieve the same firepower density or sustained combat capability as the *Arleigh Burke*-class.

Strictly speaking, the Type 052D destroyer is still a development of the Chinese Navy's first "Aegis" ship, the Type 052C. The Type 052C guided-missile destroyer, with a full displacement of approximately 6,000 tons, was the first area air defense destroyer independently designed and built by China in the early 21st century. It adopted a Combined Diesel or Gas (CODOG) propulsion system and a fully enclosed stealth design. One of its most striking features is the large, shipborne active phased array radar mounted on the bridge. According to public reports, this domestically produced phased array radar has a maximum detection range of several hundred kilometers. It features full automation from target detection and processing to weapon launch and target destruction, capable of simultaneously tracking hundreds of targets and simultaneously guiding over ten surface-to-air missiles to engage incoming threats. This capability allows it to effectively defend against multi-batch, multi-layered aerial attacks. It creates a massive, hemispherical protective space, spanning hundreds of kilometers, centered on the host ship. Its system architecture achieves essentially the same functions as the U.S. Navy's Aegis combat system; it is nicknamed "China's Aegis."

Xi'an, a Type 052C Destroyer of the Chinese Navy (Hull Number 153)

Yinchuan, a Type 052D Destroyer of the Chinese Navy

The Type 052C destroyer was the first domestically built surface warship to adopt a VLS for surface-to-air missiles. This VLS is a distinct, circular, six-cell launcher that utilizes a cold launch technique. Six groups of these launchers are located in front of the bridge, and two groups are in front of the stern helicopter hangar, totaling 48 cells. All of these are used exclusively to

fire the domestically produced "HQ-9" long-range surface-to-air missile. Simultaneously, the ship is also equipped with other shipborne weapons, including two quadruple-pack "Yingji-62" (YJ-62) anti-ship missile launchers, one 100mm naval gun, two seven-barrel 30mm Close-In Weapon Systems (CIWS), and two triple-tube light anti-submarine torpedo launchers. It also carries one shipborne anti-submarine helicopter. The commissioning of the Type 052C destroyer provided the Chinese Navy with long-range area air defense capability for the first time. However, compared to the "Aegis Ships" of foreign navies that were already in large-scale service, the Type 052C had a relatively small number of VLS cells due to tonnage limitations. Furthermore, it could only fire the HQ-9 long-range air defense missile and was not compatible with other missile types, which limited its ability to expand its multi-role combat capabilities. Consequently, after the completion of two batches totaling six ships, the Chinese Navy shifted its focus to the construction and production of its subsequent development model, the Type 052D.

The Type 052D destroyer, while retaining the basic hull structure and power plant of the Type 052C, has been refitted with an upgraded active phased array radar and other electronic equipment. It also utilizes a domestically and independently developed universal VLS with an 850mm diameter, capable of integrating both cold and hot launch missiles. This VLS can store and launch various weapons of different sizes and mission functions, including the HHQ-9B long-range air defense missile, the YJ-18A long-range subsonic-supersonic combined anti-ship missile, anti-submarine missile-assisted torpedoes, and long-range land attack cruise missiles. It also added the 24-cell HQ-10 short-range air defense missile system and was fitted with a new domestic 130mm fully automatic large-caliber naval gun. Its overall combat capability is

----------p. 35 begins----------

exponentially increased compared to the Type 052C, and its tonnage also increased from the 052C's 6,000 tons to over 7,000 tons. While possessing the main functions of the Type 055, the construction cost of the Type 052D is much lower. This is one of the important reasons why the Type 052D series can be mass-produced and equipped.

As previously mentioned, the Type 052D still exhibits several obvious deficiencies compared to the U.S. Navy's mainstay, the *Arleigh Burke*-class destroyer. Constrained by its fundamental design size and tonnage, even though its missile VLS cell count is only two-thirds that of the *Arleigh Burke*-class, the space occupied by these systems is already extremely large. This not only reduces the ship's habitability for the crew but also diminishes the capacity for storing essential fresh water, provisions, ammunition, and fuel. The consensus is that good ship habitability is crucial not only for the physical and psychological health of the crew but also directly affects the maintenance and effective utilization of their combat power. Furthermore, adequate reserves of fresh water, provisions, ammunition, and fuel are essential guarantees of a ship's endurance and combat effectiveness, as they extend sailing time, increase range, and reduce the frequency of replenishment at sea, which is particularly vital for vessels executing distant-ocean missions. However, despite multiple upgrades to the Type 052D class destroyer,

with the hull structure and power system remaining largely unchanged, its potential for further improvement has been almost fully exploited. Regardless of what further steps are taken, it will be very difficult to achieve the level of endurance and sustained firepower attained by the U.S. Navy's *Arleigh Burke*-class.

Going forward, the Chinese Navy's distant-ocean operations will become increasingly frequent. As of now, China has only established overseas support bases in Cambodia and Djibouti (in the Gulf of Aden waters). Main vessels such as the Type 052D and Type 054A frigates executing escort missions mainly rely on accompanying replenishment ships for frequent at-sea resupply during their deployment period. However, should the fleet encounter unforeseen complex situations or extreme circumstances, the deficiencies in endurance (自持力) and sustained firepower (火力持续性) inherent in vessels like the Type 052D could become a serious problem. Consequently, it is highly necessary for the Chinese Navy to develop a new generation of general-purpose destroyer.

Based on the current level of technological development in China's shipbuilding industry—whether hull design, or ship power technology marked by new high-power gas turbines, radar and electronic technology, shipborne weapon systems, and intelligent combat command systems—in all these fields, our country already possesses high technical strength. Therefore, developing a new generation of general-purpose destroyer, which are superior in distant-ocean mission capability to the Type 052D series and suitable for mass construction and deployment, should not be too difficult in the short term. Importantly, the Navy must establish a reasonable balance between the combat capabilities required for the new generation of general-purpose destroyers and their construction and usage costs. This means that the new mission capabilities must fully satisfy the Navy's performance requirements for combat equipment, and, at the same time, the construction and usage costs must be controlled within a reasonable range, to facilitate large-scale production and deployment. By doing so, a relatively small investment can enable a significant overall improvement in the strength of the Chinese Navy.

The Chinese Navy's Type 052D destroyer *Zhuzuo*

Side view of the Chinese Navy's Type 052D Destroyer, *Taiyuan*.

China's Next Generation General-Purpose Destroyer Concept

For the Chinese Navy, the main purpose and operational tasks of the future new-generation general-purpose destroyer will be the same as the current Type 052D. Namely, to serve as the

----------p. 36 begins----------

main escort force for the Chinese Navy's aircraft carriers and amphibious assault ships, executing anti-air and anti-submarine missions. At the same time, it will conduct missile strikes against distant enemy surface targets, employ long-range cruise missiles to destroy important enemy

land facilities, provide fire support for landing forces during amphibious landing operations, engage in sea blockade or anti-blockade operations, and safeguard sea lines of communication, etc. However, its overall combat capability should significantly surpass the later, improved models of the Type 052D.

With increasing aerial threats, the range of surface-to-air missiles providing persistent area defense for the fleet must continuously improve

From the perspective of operational capability requirements for the primary escort vessel of future carrier and amphibious assault ship task groups, it must satisfy the basic requirement of ensuring the safety of the formation's core—the aircraft carrier and the amphibious assault ship—in terms of air defense and anti-submarine warfare. Its main function is to intercept most enemy air-launched weapons. Therefore, as a primary escort ship, it must be equipped with enough of both air defense and strike missile weapons. Due to the global proliferation and popularization of missile weapons and unmanned aerial vehicles (UAVs), carrier task groups are facing increasingly serious threats in littoral waters. Even in a low-intensity conflict environment, a formation might be subjected to attacks by 4-8 anti-ship missiles or a small number of UAVs. In a high-intensity confrontation environment, a carrier formation could face attacks involving 40-50, or even 70-80, anti-ship missiles launched from aircraft, surface warships, and submarines, plus a large number of UAVs, simultaneously accompanied by 40-50 carrier-borne and land-based tactical aircraft conducting electronic jamming and air defense

suppression. This implies that within the formation's integrated defense system three to five of the new generation general-purpose destroyers should be capable of effectively destroying 50-70 incoming missiles and aircraft during the enemy's first-wave strike.

Taking into account factors such as the probability of effectively intercepting enemy air-launched weapons under electronic jamming, the interception capability of the ship's own air defense weapons against the aforementioned targets, and salvo rate, it will be extremely important to ensure the destruction of enemy electronic warfare aircraft operating at a distance of 250-350 kilometers (a range determined by the performance of current and future electronic warfare and aerial radar equipment). Therefore, the kill range (杀伤距离) of the future general-purpose destroyer's integrated long-range air defense missile system should be no less than 400 kilometers.

To provide information support for the air defense weapons' operations, the shipborne radar must be able to effectively detect and track various aerial targets within the horizon range. The detection range for aircraft with a large radar cross-section should be no less than 600 kilometers. The detection range for stealth bombers should be no less than 200 kilometers. The detection range for anti-ship missile targets should be 100-150 kilometers. Additionally, the radar must be capable of simultaneously tracking no less than 300 targets.

Considering the missile reserves that a potential adversary can simultaneously launch during a saturation missile attack in a high-intensity maritime confrontation environment, the total number of medium-to-long-range air defense missiles equipped on each future general-purpose destroyer should be no less than 120. Furthermore, the close-range air defense weapons should be capable of ensuring the destruction of more than three incoming aerial weapons that have successfully penetrated the medium-to-long-range defenses.

Considering that the carrier task group escort ships will also participate in missile strikes against distant enemy maritime targets and anti-submarine warfare, the future general-purpose destroyer must also be equipped with a certain number of anti-ship and anti-submarine missiles. In fact, the wartime destruction of large enemy surface task forces (such as aircraft carrier or missile ship strike groups) is always one of the most important and challenging missions for carrier task group escorts, and breaking through the enemy fleet's air defense system requires the expenditure of a large amount of ordnance. In the composition of the main shipborne strike weapons, depending on the operational formation of the enemy fleet, there must be 12-24 hypersonic anti-ship missiles and 30-40 anti-ship cruise missiles. Additionally, a missile reserve must be maintained to expand the combat outcome—i.e., to destroy enemy ships that still maintain combat power. Therefore, destroying an enemy surface task force may require a penetration of 50-70 or even more long-range missiles. Assuming that the surface escort ships for a future Chinese Navy carrier task group generally consist of two Type 055 large destroyers and two or three new general-purpose destroyers, then each destroyer's VLS must be configured to carry 30-40 anti-ship missiles. Furthermore, a reasonable ammunition reserve must be established for

unforeseen needs, with the reserve volume accounting for about 20 percent of the total ordnance load. In other words, to effectively carry out the mission of striking and destroying enemy surface task groups, the number of anti-ship missiles equipped on each destroyer should reach 36-48.

The "Yingji-18" (YJ-18) long-range anti-ship missile independently developed by China.

----------p. 37 begins----------

The ammunition requirement for the future general-purpose destroyer's anti-submarine warfare (ASW) operations should not be very large. Depending on the operational characteristics of enemy submarines and the nature of the ASW mission, generally 6-8 anti-submarine missiles and close-range anti-submarine torpedoes should be sufficient to meet escort operation needs. The key to ASW is the search and detection of submarine targets. Therefore, the future general-purpose destroyer needs to be equipped with a high-performance integrated sonar system, a towed sonar array, two anti-submarine helicopters, and multiple UAVs to ensure long-duration monitoring of the air and sea surface.

Considering that the future general-purpose destroyer will also be tasked with ballistic missile defense (BMD) missions, it must be configured with 24-32 missiles capable of intercepting ballistic missiles during wartime. To meet all requirements, each escort destroyer needs to be equipped with 72-96 large-caliber VLS cells. Each VLS cell must be versatile, capable of accommodating one large air defense missile, or four medium air defense missiles (quad-packed), or one hypersonic anti-ship ballistic missile, or two anti-ship/land-attack cruise missiles. The type and proportion of ammunition configured in wartime will be determined by the specific nature of the mission being executed. Simultaneously, the ship should be equipped with the HQ-10 (Hongqi-10) close-range air defense missile system, the Type 1130 Close-In Weapon System (CIWS), and a laser defense system. Considering the need for the future general-purpose destroyer to engage light enemy vessels when operating in littoral environments, shipborne

helicopters and UAVs will be important assets for long-range detection and striking enemy fast attack craft swarms. The primary combat weapons for this role will be the naval gun and ship/airborne close-range anti-ship missiles, with the ammunition load needing to be sufficient to ensure the destruction of more than four enemy missile boats or light frigates.

The HQ-10 is a high-performance, short-range air-to-air missile system, made more adaptable by its modular design, which lends enhanced flexibility

To execute the fire support mission for amphibious landing operations under modern conditions, the future general-purpose destroyer should be equipped with a naval gun with a range permitting the ship to simultaneously strike and destroy enemy shore targets while also remaining outside the range of enemy coastal artillery. This implies that the naval gun's maximum effective range, when firing conventional ammunition, should be no less than 40 kilometers, and it should be capable of sustaining fire for 100-120 rounds. Therefore, the future general-purpose destroyer should be equipped with a new type of 155mm large-caliber naval gun.

Compared to the current active 130mm caliber naval gun, the 155mm caliber naval gun offers a longer range and greater destructive power against targets, which can significantly enhance the

China's ability to design stealthy surface warships has reached the point of consummate mastery; in the future, if new types of surface warships are developed, their stealth performance will inevitably be even more outstanding.

----------p. 38 begins----------

sustained firepower strike capability of naval vessels against distant maritime and land targets. However, the overall system's volume and weight are also greater than the 130mm gun, imposing basic requirements on the host ship's size and tonnage. Furthermore, the ship must possess comparatively good crew habitability and reasonable capacity for all compartments, including fresh water, provisions, ammunition, and fuel. This implies that the size and displacement of the future general-purpose destroyer should be at least similar or equivalent to the U.S. Navy's *Arleigh Burke*-class. To ensure that mission capability requirements are met while simultaneously controlling costs, the future general-purpose destroyer should adopt proven and mature technologies and systems as much as possible.

Since entering the 21st century, surface vessels designed and constructed domestically—whether they are missile boats and unmanned vessels of several hundred tons, frigates and destroyers of several thousand tons, or even large destroyers of the 10,000-ton class—have adopted various naval stealth technologies. These include stealthy hull design, noise reduction and shock isolation for power and mechanical equipment, and thermal insulation and cooling measures for heat dissipation equipment. These techniques have not only become major features of domestically produced surface warships, but their technical level is also continually improving.

Therefore, it can be believed that the future general-purpose destroyer will further enhance its hull stealth capability by inheriting the already very mature domestic stealth technologies in various aspects. Although the main dimensions and displacement of the future general-purpose destroyer will be much larger than the current Type 052D class, its stealth performance should be fully guaranteed with the continued progress in domestic hull stealth design and other comprehensive stealth technologies.

As for its core detection equipment, the shipborne phased-array radar system, the general-purpose destroyer could adopt the Type 346A multi-function active phased array radar currently equipped on the Type 052D destroyer, or an upgraded version of it. Judging from the analysis and evaluation of this radar type by foreign experts, its performance—including its detection range, the number and batches of targets it can simultaneously track and process, and its anti-jamming capabilities—is at an advanced international standard. This performance is sufficient to meet the operational capability requirements of the future general-purpose destroyer in a modern, high-intensity naval warfare environment. Simultaneously, in terms of the design and arrangement of the superstructure and open-air equipment, the vessel should employ a superstructure design with higher integration. Various antennas should be embedded into the exterior walls of the superstructure, and a construction like the Type 055's overall enclosed integrated mast structure should be adopted.

Large flat-panel array radar antennae have already become the standard configuration for advanced destroyers in the Chinese Navy.

Regarding the propulsion system and considering the requirement for low cost in terms of economy and endurance (such as escort duties and lengthy patrols), the future general-purpose destroyer should ideally adopt a "Diesel-Gas Turbine-Electric hybrid" power system. Specifically, this would be a combination of a CODAG (Combined Diesel and Gas turbine)

system—with two gas turbines and two diesel engines—and an Integrated Electric Propulsion (IEP) system. This configuration can not only guarantee the ship's high-speed sailing capability, thus meeting the requirements for escorting aircraft carriers, but also save fuel during low-speed cruising and provide sufficient power support for future high-energy weapon systems. Public reports indicate that domestic industry has successfully developed and possesses the production capability for 30 MW and 40 MW class gas turbines. Therefore, a CODAG configuration featuring two new high-power gas turbines plus two auxiliary diesel engines can fully guarantee the sailing performance of the future general-purpose destroyer, whether it is engaged in general missions or acting as a close escort for an aircraft carrier, while also helping to control costs.

The future general-purpose destroyer will also possess a larger hangar and helicopter landing deck, allowing it to be equipped with two medium-sized shipborne helicopters. This increases the ship's helicopter deployment capability, improves the conditions for using shipborne helicopters, and enhances various mission capabilities such as aerial reconnaissance, early warning, Over-the-Horizon Targeting (OTH), weapon guidance, ASW, search and rescue (SAR), and replenishment.

The improvement in shipborne helicopter deployment capability is critical for a general-purpose destroyer serving in a carrier escort formation. Whether implementing anti-submarine patrols or engaging in fleet-wide ASW operations, this means that the number of helicopters and their usability are effectively multiplied compared to formations with an equal number of surface escort vessels, thereby substantially increasing the formation's sea area control and submarine detection/attack capabilities. Simultaneously, the increased area of the hangar and helicopter landing deck will also be beneficial for enhancing the deployment and utilization capabilities of shipborne UAVs.

Currently, the application of shipborne UAVs is becoming increasingly widespread in areas such as large-scale aerial surveillance, reconnaissance and monitoring, guiding attacks, and conducting electronic jamming against enemy combat systems. As a naval weapon system with great development prospects in the informatized maritime battlespace, its importance in modern naval warfare is increasingly evident. Therefore, improvements in the future general-purpose destroyer's ability to deploy and utilize shipborne UAVs will undoubtedly contribute to the further development and enhancement of the Chinese Navy's surface fleet's overall combat capability.

The Z-20 shipborne variant will become the primary shipborne helicopter for destroyers in the Chinese Navy.

----------p. 39 begins----------

Furthermore, the functional requirements for modern surface combat platforms have shifted. They no longer focus solely on the comprehensive combat capability of a single ship, but now simultaneously emphasize digitized collaborative combat and coordination. Therefore, modern surface warships have a multifaceted role. They must be equipped with advanced detection, communication gear, and powerful weapons, but they must also act as both a sensor and a network node. This means they must use information networks to share real-time target data with other combat platforms and guide their external firepower. Simultaneously, they must be capable of utilizing external sensors and theater-wide intelligence to conduct collaborative, digitized operations.

According to public reports, the active, domestically produced main warships, represented by the Type 052C/D and Type 055, have universally adopted China's independently developed operational command system and multi-purpose information processing system. This system integrates the ship's various subsystems (such as radar, electro-optics, sonar, electronic warfare, helicopter, communication, navigation/weather, power plant, NBC environmental control, and auxiliary machinery) into a single holistic system. It can quickly complete the detection, tracking, threat assessment, and strike weapon allocation for multiple targets in a short time. Furthermore, it can rapidly collect, correlate, process, store, display, and assist in decision-making for target intelligence gathered from various sensors. The system possesses full automation functionality—from target detection and information processing to weapon launch and target destruction.

The informatized collaborative combat system equipped on the ship possesses the ability to receive real-time information from all nodes across sea, land, air, space, and sub-surface domains. It can rapidly process air, sea, and underwater target information transmitted via data

links from various sensors on platforms such as ships and helicopters, quickly discern and assess the data, and promptly generate a tactical situation map on a large PDP display screen for the commander to grasp the situation. Simultaneously, the vessel is capable of automatically assigning sensor tasks, tracking a wide number of suspicious targets, and automatically allocating targets to the corresponding combat units (including itself and other units). It can coordinate its subsystems—including surface, air, anti-submarine (with shipborne helicopters), and electronic warfare—to maintain the optimal state of readiness. We have reason to believe that the future general-purpose destroyer's operational command system and informatized collaborative combat capability will not only be no weaker than the active Type 055 and Type 052D but will certainly feature new developments and improvements.

A partial view of the Combat Information Center of the Chinese Navy's Type 055 destroyer.

Undoubtedly, the development of naval equipment technology and combat capability is guided by naval operational requirements and driven by the advancement of modern science and technology. The rapid progress of high technology provides the new material foundation for naval equipment technology to step into a new stage. Given that naval capability for far-seas protection under modern conditions is an integrated, combined combat capability composed of multiple services, various combat platforms, and methods of engagement, and focusing on the need to implement the long-term mission of far-seas defense in the future, the Chinese Navy must not only intensify efforts to expand its fleet aviation combat power—symbolized by the aircraft carrier platform—but also accelerate the development of general-purpose surface combat platforms with greater endurance and stronger overall combat capability.

China already possesses relatively advanced advantages in its scientific research, industrial system, and production technology. The continued stable growth of the Chinese economy provides crucial material conditions and economic support for the further expansion of the Chinese Navy's power in this new era. Therefore, looking to the future, the Chinese Navy’s establishment of a stronger distant-ocean combat system capable of defending national interests across the entire global scope is fully to be expected.

The activities of the Chinese Navy in the distant oceans are becoming normalized