

# ARCHIVED REPORT

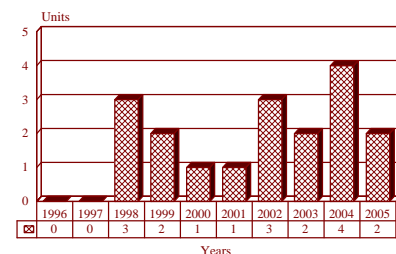
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## Project F25T Naresuan Class - Archived 11/97

### Outlook

- Two ships now in service with Royal Thai Navy
- Offered to Pakistan and Bangladesh
- Version reportedly under construction for Chinese navy
- Construction standards reported to be poor
- Ships reputedly are difficult to maintain

10 Year Unit Production Forecast  
1996-2005



### Orientation

**Description.** General-purpose frigate intended for export market.

**Sponsor**

China National Machinery Import and Export Corp  
(Machimpex)  
Erligou  
Xijiao  
Beijing, China

**Contractors**

Zhonghua Shipbuilding  
Shanghai  
China

**Licensee.** No production licenses have been granted.

**Status.** Production and service.

**Total Produced.** Two ships have been built for Thailand.

**Platform**

Name	Builder	Ordered	In Service
621 <i>Naresuan</i>	Zhonghua Sbdg	9/1989	10/1994
622 <i>Taksin</i>	Zhonghua Sbdg	9/1989	10/1995

**Application.** The F25T class are designed to perform patrol and other general-purpose duties. The design is orientated to the export market.

**Price Range.** The two Naresuan class frigates cost US\$90 million each.

### Technical Data

**Characteristics**

Speed (maximum):	32 kts
Speed (cruising):	18 kts
Range:	4,000 nm at 18 kts
Crew:	24 officers, 125 enlisted

<b>Dimensions</b>	<b>Metric</b>	<b>US</b>
Length:	120.0 m	393.7 ft
Beam:	13.0 m	42.7 ft
Draft:	3.8 m	12.5 ft
Displacement (standard):		2,500 tons
Displacement (full load):		2,980 tons
<b>Armament</b>	Type	Quantity
Missiles:		
SSM	Harpoon	2x4
SAM	VL Sea Sparrow	1x8
Guns:		
Medium caliber:	5 in L54 Mark 45 mod 1	1
CIWS:	37 mm Breda-Bofors	2x2
Torpedoes:		
Tubes:	Mark 32 mod 5	2x3
Torpedoes:	Mark 46 mod 5	6
<b>Electronics</b>		
Radar:		
Air/sea search:	SPS-49(V)5	1
Surface search:	SPS-64(V)5	2
Target acquisition:	RAN-10S	1
Missile fire control:	Signaal STIR 2.4	2
37 mm fire control:	RTN-30X DARDO	1
Electronic warfare:		
ESM:	ELT-211/Newton Beta	1
ECM:	ELT-521/Newton Beta	2
	ELT-318/Newton Beta	2
Decoy launchers:	Mark 36 SRBOC	2x6
	FJF-1	2x26
Sonar:	SJD-7	1
Propulsion	Type	Quantity
Main propulsion:	CODOG	
Gas turbines:	LM-2500	2x27,500 shp
Diesels:	MTU 20V1163 TB83	2x7,365 shp
Propellers:	Cycloidal pitch	2

**Design Features.** The Project F25T design is a further development of the Project 053HT "New Missile Frigate" built for the Chinese navy. The F25T features a lengthened and extended hull to incorporate a helicopter hangar aft. Although the F25T bears a distinct family likeness to the earlier designs, internally the ships are totally different. Much German technical assistance has gone into the design of these ships, and they are often called the "DeMEKO'd MEKOs" as a result. This is not inaccurate; the F25T is basically the MEKO 200 design modified for construction by Chinese yards, with the modularity characteristic of the MEKO family deleted.

The hull form is relatively conventional, being flush-decked with marked bow sheer and flare. The rake of the prow is dictated by the installation of a Chinese SJD-7 sonar in a bow dome. The bow form itself has a pronounced knuckle and a large breakwater forward of the

main gun. The quarterdeck is covered by the helicopter flight deck, providing a sheltered working area on the fantail. This would normally be used for handing a towed array or VDS fish, but there are no plans for such an installation at this time.

The superstructure is a single unit with the 01 level plated in and a capacious bridge structure. The CIC is located behind the main bridge, but no command system for these ships has yet been specified. Gas turbine intakes are grouped in a central island, the top of which supports the primary search radar. The helicopter hangar is installed aft, with the two 37 mm DARDO CIWS mounted flanking it and the DARDO fire control radar installed on top.

The propulsion system of these ships is a conventional CODOG layout, with two MTU diesels providing cruise power while the LM-2500 gas turbines are used for boost. The propulsion machinery is geared to two

shafts equipped with cycloidal pitch screws. There are two machinery rooms, one for the diesels (aft) and one for the gas turbines (forward). The gearing is not installed in a separate compartment, although a soundproofed engineering control room is provided, located between the engine rooms.

Initial Thai reports are that the construction standards of these ships are substantially better than those of the four Jianghu class frigates purchased earlier, but still below those normally accepted for Western construction. A particular problem with these ships is reported to be that design changes imposed by the German technical advisory teams were executed by the Chinese shipyards without altering the other blueprints affected by the change. As a result, the internal arrangement of the ships is illogical, with some compartments having hatchways set in blank bulkheads while other compartments have no access at all.

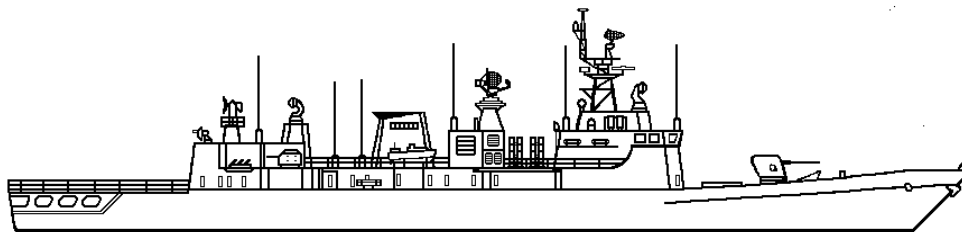
**Operational Characteristics.** The primary anti-ship armament of the F25T design is the battery of eight Harpoon missiles installed in two quadruple launchers behind the bridge. These are supported by a single FMC 5 in L54 Mod.1 gun mounted on the forecastle. Originally, these ships were to have received a Chinese-designed twin 100 mm mount using a French autoloader designed for the GIAT 100 mm L55, but the gun was changed following Thai concerns as to the safety of the twin mount.

Air defense is provided by an integrated point defense system which combines vertical-launch Sea Sparrow missiles in an eight-round VLS forward and two Breda-Bofors Twin Fast Forty (chambered for Chinese 37 mm ammunition) mounts aft. The capacity of the forward VLS is restricted by the hull form at that point, there being insufficient hull depth to accommodate a larger VLS. The target acquisition for the gun-missile system is provided by an E/F-band RAN-10S radar mounted on the foremast. This set was produced under license in China as the Type 360. Two STIR 2.4 radars provide missile fire control

(thus giving two missile channels), while the 37 mm guns aft are controlled by an I/J-band RTN-30X Orion radar (license produced in China as the Type 374). The complete structure is effectively a modified and Chinese-produced version of the DARDO CIWS system installed on Italian warships.

Anti-submarine capability is limited. The primary ASW sensor is a Chinese SJD-7 medium-frequency sonar installed in a bow dome. The antecedents of this set are unclear, but there is evidence to suggest it may be the French DUBA-25 system produced under license. ASW weaponry is restricted to two triple Mark 32 torpedo tubes installed amidships. No reload torpedoes are carried. The helicopter aft is tasked with general surveillance duties, target location for the Harpoon missiles and anti-ship attack with light air-to-surface missiles. Contrary to many reports, no order for these helicopters has yet been placed, although negotiations for ex-US Navy Kaman SH-2F Seasprites are continuing. A reported purchase of nine Chinese Zhi-9 (license-built Dauphin) helicopters never took place.

The electronic warfare fit is a standard Elettronica-designed Newton Beta produced under license in China as the Mirage EW system. This includes an ELT-211 ESM system with a masthead omni and scanner arrays and a DF array wrapped around the foremast under the yardarms. Four jammers are provided, two ELT-318 barrage jammers in cylinders and two ELT-521 deception jammers. All are mounted on the 03 bridge level. The ELT-521 jammers are not mounted in the normal mushroom radomes housing ELT-828 antennas but in a new quadruple-cylinder installation similar to that used for Nettuno. In all cases, the Chinese-built equipment has the same Type number as the Elettronica designation with Type-replacing ELT-.



## Variants/Upgrades

The Chinese navy has proposed a variant of this design with an all-diesel propulsion plant. This variant is

reported to be under construction for the Chinese navy and also available for export.

## Program Review

**Background.** The design process of the F25T class started in July 1988 when the Royal Thai Navy ordered four Project 053HT Jianghu class frigates from China. The original Thai plan was to order these ships as bare hulls and to equip them with Western weapons and sensors on arrival. The Chinese objected to this since they were offering the ships at "friendship prices" and wished to supply them in standard configuration. This implied that they intended to sell ships under construction for the Chinese navy. This was not acceptable to Thailand.

A compromise was reached by which these four ships would be supplied fully armed and equipped, but utilizing Western systems produced under license in China where possible. Two of the ships were to be modified with helicopter hangars and flightdecks aft. In addition, Thailand would order two more ships of an enlarged design which would be designed to carry Western weapons and sensors from the outset. This design would then be offered by China on the export market, with target customers being in the Middle East and Southeast Asia.

The order for the two ships was signed in October 1989. By mid-1990, Thailand was growing perturbed about the construction standards of the first four ships. Thai naval officers visiting the frigates under construction related stories about watertight doors not closing, a complete absence of internal damage limitation, poor welding standards, exceptionally poor safety standards with regard to electrical wiring and many other faults. Frigates in service with the Chinese navy had poor serviceability and required extensive maintenance commitments. As a result, Thailand decided to cancel its order in September 1990.

This decision was reversed after a compromise was arranged. The design of the F25T class would be revised to incorporate technical advice and assistance from the German shipbuilding industry. The construction of the F25T class would be subject to German technical

supervision and would have to pass German quality control inspections at various points in the building process. This was expected to delay delivery of the ships by approximately nine months, with the first ship expected to be handed over in late 1992.

In fact, the building process was to be delayed by substantially longer than this, and the first of the two ships was not ready to run trials until August 1993, some 14 months later than the planned date. At this point the ship was structurally complete but lacked much of its internal electronics. In common with the earlier four ships, the two F25T class frigates required substantial remedial work on their arrival in Thai waters, which delayed their service entry still further.

While the Thai program was in progress, China continued with development of the F25T design and made strong efforts to export the design. The type was one of those offered to the United Arab Emirates to fulfill its eight-ship frigate requirement and was also offered to Turkey. In neither case did the design get past the first selection process. Export promotion of the design continues, with an all-diesel version being offered alongside the existing CODOG ship.

In mid-1995, a delegation from the Pakistan navy visited Thailand to obtain first-hand operational experience concerning the Naresuan class from the Thai navy. This visit coincided with the departure of a negotiating team from Pakistan to China to finalize a major procurement package. The deal is reported to include three "frigates" of unspecified type, two fleet oilers of the Fuqing class and between eight and twelve missile-armed fast attack craft. While the US embargo on military sales to Pakistan continues, the supply of LM-2500 gas turbines for the new ships is improbable. The Pakistan deal therefore probably envisages acquisition of the all-diesel version.

## Funding

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The F25T design was funded jointly by the Royal Thai Navy and the Chinese State Shipbuilding Corporation.

## Recent Contracts

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No contractual information is currently available.

## Timetable

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Jul	1988	First Chinese frigate order placed
Oct	1989	Order for two additional frigates placed

November 1996

Sep	1990	Contract revised to include German technical supervision
	1991	Ships laid down
Jul	1993	First ship launched
May	1994	First ship started to run trials
Oct	1994	First ship delivered to Thai navy

## Worldwide Distribution

### Thailand (2)

## Forecast Rationale

The F25T is the latest and most modern small frigate design produced by the Chinese navy. As such, it forms a small, low-cost supplement to the Luhu class frigates. Current reports from China suggest that the F25T design will be produced for the Chinese navy in two versions, one being identical to the Thai F25T, the other lengthened and equipped with a six-barreled launcher for CY-1 anti-submarine missiles as fitted to the existing Jiangwei class. It is also reported that the Chinese navy version will have four diesel engines rather than two diesels and two gas turbines.

The F25T is, however, mostly aimed at the export market, with the Middle East, Africa and Southeast Asia as primary targets. In these regions it has the undoubted advantage that it costs approximately a quarter of the price of an equivalent Western ship. This may be the decisive factor to countries with maritime interests to safeguard yet also with very severe limits on their procurement budgets. Against this low procurement cost must be set the evidence that poor construction standards and difficulties in maintenance make Chinese-built ships expensive to run. This cost balance between procurement and support budgets is a very difficult one to strike.

There are four likely candidates for the Pakistani frigate purchase. The first is the Project 053HT Jianghu IV class as sold to Thailand in 1989. This has the advantages of being the lowest cost option while still offering significant anti-ship firepower. The Jianghu is, however, an old design. It is short-ranged, poorly equipped and deficient in air defense and anti-submarine capability.

These factors would be eliminated by the acquisition of the Project 051 Luda design (see report). The design offers much greater capability than the Jianghu, but has a high crew requirement and its orientation to ASW may not fit Pakistani tactical demands. A comparable prospect to the Luda III is the Project 052 Luhu class (see report). While the Luhu class would be a powerful addition to the Pakistani fleet, technical problems with the design are slowing construction to a crawl. The final option is the F-25T Naresuan class.

There are several other likely export customers. Egypt is one, with a possible order for two or four ships to replace the existing fleet of very old ex-British and ex-Soviet construction. Bangladesh is another possibility; here the existing fleet consists of old British frigates which have large crew requirements and aging hulls. This is a case where the F25T would represent a qualitative advance and possible reductions in expenditures. Burma, Vietnam, Cambodia, and the Philippines have all expressed interest in the design.

The following forecast is based on the placing of a limited number of export orders for F25T design ships. We believe that the pattern will be for small orders of two or three hulls from countries without the resources to buy more advanced ships. We are also projecting a steady two-ship-per-year run from about 1998 onward to replace the Jianghu class.

## Ten-Year Outlook

		ESTIMATED CALENDAR YEAR PRODUCTION												
		High Confidence Level					Good Confidence Level				Speculative			Total
Designation	Application	thru 95	96	97	98	99	00	01	02	03	04	05	96-05	
PROJECT F25T	FF (CHINA)													
NARESUAN		0	0	0	1	0	1	1	1	2	2	2	10	
PROJECT F25T	FF (VARIOUS)													
NARESUAN		2	0	0	2	2	0	0	2	0	2	0	8	
Total Production		2	0	0	3	2	1	1	3	2	4	2	18	