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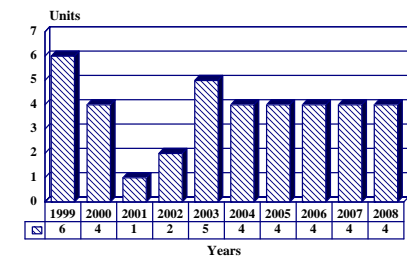
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Dagaie/Sagaie - Archived 12/2000

Outlook

- Kuwait has received its last Dagaie systems
- Argentina is expected receive last Dagaie system by end of 1999
- France to receive one Dagaie and one Sagaie system in 1999, and one Dagaie system in 2000
- Morocco to receive Dagaie systems, two in 1999 and two in 2000
- Saudi Arabia expected to receive one Dagaie system in 1999, 2000, and 2001, two systems in 2002, and one system in 2003

10 Year Unit Production Forecast
1999 - 2008



Orientation

Description. Naval chaff/flare dispensing system that provides infrared flare and chaff cloud decoys. Sagaie uses Dagaie as part of an automated defense system.

Sponsor

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Licensees. No known production licenses have been granted.

Status

Dagaie Production and in service.
Sagaie Production and in service.
Magaie Defunct.

Total Produced. An estimated total of 204 systems were produced through 1998.

Application. Dagaie has been designed for the protection of small-to-medium-sized vessels against missile attacks. It does this by providing dual chaff and decoy flare capability. Sagaie is an automated system based on the Dagaie system. It is used to support Dagaie or to be used independently on larger surface ships. Magaie

was a lightweight derivative of the same for fast-attack craft (FAC) and other small patrol craft but is no longer being produced.

Price Range. Analysis based on the known costs of comparable systems indicates a unit price of about US\$1 million for Dagaie and US\$2.5 million for Sagaie, including the necessary ancillary equipment.

Technical Data

	<u>Metric</u>	<u>US</u>
Characteristics		
Chaff cartridge range	8 km	5 mi
Flare cartridge range	3 km	1.8 mi
Re-aiming/90 deg. arc	<2 s	
Maximum training arc	330 deg	
Slewing speed	1.5 rad/s	
Average reaction time	<4 s	
Mounting weight	500 kg	1,100 lb

Design Features. Dagaie is a short-range decoy system that accepts threat information from a number of sources, including combat management systems incorporating electronic support measures (ESM) modules or suites. The trainable launcher is loaded with cartridges, or suitcases, containing either 33 predirected chaff rounds or 34 predirected infrared (IR) flares. The 40 kilogram rockets have a 24 kilogram payload and a flight speed of 250 meters/second on average. Alternative suitcases are available to deploy decoy clouds at different altitudes and ranges. A typical installation includes two 10-tube launchers on a ship (depending on the size).

The Dagaie launcher is easily reloadable and fired by mortar automatically on receipt of a threat warning. Firing data are obtained by evaluating the threat relative to the platform situation, taking into account the threat's bearing, relative wind direction and velocity, as well as the ship's heading and speed. A solution is automatically proposed to give optimum decoy potential. This includes providing recommended helm orders. Reaction time is on average about five seconds from the observation of the threat to the launch of a countermeasure.

The system is mounted on all sizes of ships that range from 800 tons and upward. Single launchers are deployed in smaller vessels. In most cases, Dagaie operates in conjunction with the DR-3012 radar warning receiver.

Operational Characteristics. The chaff version fires projectiles radially creating a large cloud of electro-

magnetic chaff. The IR version's projectiles have parachutes that lower the material in sequence, thus prolonging the effective life of the IR decoy. Two different types of decoy are available in the suitcases. A combination of both types makes possible deployment of clouds at maximum altitudes of 150 and 300 feet. As a result, a very large cloud can be built, with a radar cross section of 24,000 square yards. A smaller cloud, of 3,600 square yards, is provided by a different suitcase intended specifically for small vessels.

The decoy's bloom time is less than two seconds and each suitcase will exhibit 132 blooming points over the spread of the cloud. As a result, a radar reflector area of more than 5,500 square yards is obtained, covering the radar bands H through J and lasting more than 10 minutes. The IR decoy lasts 30 seconds, with an area of 360 square yards at an altitude of 45 feet. The individual decoys descend into the water at one-second intervals after having drifted with the wind.

The Sagaie decoy system operates either independently or together with Dagaie on larger ships, providing longer range chaff or IR deployment. Sagaie is fully automatic and can accept threat data from any of the shipboard data management or processing systems attached to shipboard sensors. Standard installations include two 10-tube trainable and elevatable launchers (one per side) fired from the CIC. Each 40 kilogram rocket carries a 24 kilogram payload and is fired from its shipping container. The system can be used in the confusion or distraction mode, but can also be used with a naval jammer to carry out any of the substitution modes.

Variants/Upgrades

AMBL-1A. French navy designation for Dagaie Mark 1.

AMBL-1B. French navy designation for Dagaie Mark 2.

AMBL-2A. French navy designation for Sagaie.

Dagaie Mk II (Mark 2). Is the model now being sold, as either a standalone system or in conjunction with Sagaie (on larger ships). The Mark 2 is also available as a retrofit option for the original (Mark 1) version of Dagaie. It offers easier integration of equipment with a central processing system (NTDS) and centralized operation in conjunction with other EW equipment. Ammunition has been upgraded with the introduction of new LIR and LEM ammo, which require new software for firing. Also, the availability of the new electro-magnetic medium-range ammunition, REM, allows the Dagaie more capability to operate even without a jammer in an EW attack.

Upgrading of Mark 1 to Mark 2 is done by basically changing the supervision unit and modifying the data processing unit. The latter comprises replacing processor and acquisition racks; making minor modifications on the ancillaries racks; and setting up of the rocket launcher modules.

DR-3012. Dagaie is frequently found in conjunction with the DR-3012 radar warning receiver. This is a very simple system with a small, manually searched library. Its main importance is as a set-on RWR for the Dagaie launchers, providing improved reaction time over that obtained using the DR-2000 or DR-4000 ESM systems. DR-3012 is broadly comparable with Matilda.

A torpedo decoy round is being developed for the Dagaie Mark 2 and Sagaie launchers. This will form part of the Spartacus torpedo defense system.

LURES. The Litton Urgent Response Electronic Seduction (LURES) active decoy system, released in 1995, has been built so that it can be launched from either the US-made Mark 36 SRBOC launcher or the Dagaie Mark 2. It is the long-range system Sagaie, and not the short-range system Dagaie, that uses rockets instead of suitcase-configured decoy batteries. In essence, LURES is a rival product to French decoys offered for the Sagaie and offers its users an American alternative for the decoys while retaining their launch systems.

Magaie. A now-defunct version offered particularly for smaller craft, using only a combination of IR and chaff for ammunition. The number of suitcases loaded per launcher was three, instead of Dagaie's 10.

Magaie attempted to decoy incoming missiles using centroid or fully automatic break-lock techniques. The mortars were trainable in azimuth but fixed in elevation. Its interface capabilities were similar to those of Dagaie. Standard installations would have included one or two launchers per ship. Reaction time and slewing rate were the same as Dagaie's. The name suggested a miniaturized version of the same system (Mini-dispositif d'Autodéfence pour la Guerre Antimissile Infra-rouge et Electromagnetique).

Squid. The Dagaie system has been also marketed under the name "Squid."

Program Review

Background. Dagaie was originally developed by CSEE in response to a French requirement. However, it has since been procured by 17 navies worldwide. The system has been mounted on a variety of platforms, ranging from modern corvettes to refitted older vessels. Fleets employing the systems include those of Argentina, Bahrain, Colombia, France, Kuwait, Malaysia, Morocco, Peru, Saudi Arabia, Thailand, Tunisia, and the UAE.

Magaie was developed to provide a self-protection electronic countermeasures (ECM) capability for smaller vessels. The manufacturers also considered the system appropriate for larger vessels, particularly those where deck space was already at a premium. Potential customers, however, did not agree.

Sagaie, an acronym from the French description *Système d'Autodéfence pour la Guerre Infra-rouge et Electro-magnetique*, was ordered by the French navy in 1986. Systems were reportedly deployed aboard the Cassard anti-aircraft frigates, Suffren class destroyers, the aircraft carriers FS *Foch* and FS *Clemenceau*, and the nuclear aircraft carrier FS *Charles de Gaulle*. Financial stringencies resulted in a more restricted scale of issue. Sagaie was also offered for export. On February 1, 1988, CSEE announced the award of a contract from the Italian navy calling for the supply of Dagaie Mark 2 for the Luigi Durand de la Penne class destroyers. This contract turned out to be for the Sagaie system and is recorded as such.

The Peruvian navy had plans to retrofit double Dagaie to its ex-Netherlands Friesland class destroyers, four of which are in service, with a further two in reserve. It

was also intended to install both Dagaie and Sagaie on the Peruvian cruiser *Almirante Grau* in 1986, but this was aborted due to funding difficulties. None of these installations have become reality or are likely to do so, although the Dagaie equipment on *Almirante Grau* has been made operational.

In 1992, CSEE secured two major orders for Dagaie that marked the end of a long dry spell for the system. These orders were for Taiwan, seven systems to equip six Lafayette frigates plus one spare, and Qatar, four systems to equip the Vita class FAC-M. The Qatari order was finalized in 1994 when the Dagaie system was included within the integrated Sidewind EW suite. French naval EW orders since then have included systems to equip two La Fayette class frigates for the Saudi navy, four fast-attack craft for Indonesia, and eight patrol craft for Kuwait. There is no confirmation that Dagaie or Sagaie have been included in any of these, although the Kuwaiti craft are reported to have provision for the Dagaie system, but not the equipment itself.

It is interesting to note that while purchasers of SRBOC, Corvus, and Shield systems return to purchase further installations as retrofits or to equip new hulls, Dagaie purchasers rarely do so. The two latest customers reportedly relate more to the availability of a new integrated shipboard electronic warfare outfit based on the DR-3000 ESM system, the Salamandre jammer, and the Dagaie/DR-3012 decoy launcher, than to the merits of the Dagaie Mark 2.

Information released in May 1995 on the new Litton Urgent Response Electronic Seduction (LURES) active decoy system indicated the rocket can be launched from either a standard Mark 36 SRBOC system or a Dagaie Mark 2 launch system. When a product intended for two leading launch systems comes from such a leading contractor, it means both are likely very widely spread. Manufacturing a decoy product that goes on either system serves Litton in expanding its market, while still acknowledging the existence of a large base of Dagaie Mark 2 systems. The owners of those systems can now stay with the Dagaie but have the option to use American decoys if they so desire. In short, this gives even more credence to the French hardware which will likely be around for many years to come.

In July 1997, the first two of four fast-attack craft from the Vita class of the Qatari Emiri Navy, QENS *Barzan* and QENS *Huwar*, were fitted with the Dagaie Mark 2 decoy-launchers. These two systems were procured under a 1992 contract. Also in 1997, it was announced that the Royal Saudi Arabian Navy is expected to be adding a third F3000S (La Fayette class) frigate to its

fleet, which also will receive the Dagaie Mark 2. Only one frigate of this class has received the system so far.

Newest Information. South Korea reportedly signed contracts for the procurement of three Okpo class destroyers in 1993. However, due to many delays within the program, the first steel cut took place in April 1994. Under the new Okpo class destroyer program the first destroyer, *King Kwanggeaeto*, was commissioned on July 24, 1998, and the second destroyer, *Euljimundok*, was commissioned in March 1999. The Okpo schedule continues, with the third destroyer, *Yangmanchun*, scheduled for commission in December 1999. All three Okpo destroyers reportedly have four Dagaie Mark 2 systems installed.

In February 1999, it was reported that South Korea awarded BAe a contract to build three additional KDX-2 destroyers. (KDX-2s are the newest variant of the Okpo destroyers.) Although there has been no present confirmation, there is also speculation that South Korea will procure an additional three KDX-3 destroyers once the KDX-2s have been commissioned. Four Dagaie Mark 2 systems are expected to be installed on each of these new destroyers. These two purchases would up the amount of Dagaie systems being produced by 24 systems.

Kuwait is reportedly in the process of procuring eight Um Almaradim (Combattante I) class fast-attack craft. Each of these eight ships are expected to be equipped with two Dagaie Mark 2 systems. The first four ships were commissioned from July 1998 through December 1998. The fifth and sixth ships were commissioned in May 1999 and the last two ships are scheduled to be commissioned in April and May 2000. The Dagaie Mark 2 systems are assumed to have already been installed, or to be in the process of installation.

In addition to the above two nations, four additional countries are reportedly in the process of procuring ships that are expected to have the Dagaie Mark 2 systems installed. These four countries are Argentina, France, Morocco, and Saudi Arabia. France should also be completing its last purchase of Sagaie by the end of 1999.

Argentina is reportedly procuring six Espora (Meko 140) class frigates equipped with the Dagaie system. The first four of these frigates were delivered by 1990 but the last two have more current dates. The fifth frigate, HMS *Robinson*, is scheduled to be commissioned in June 2000 and the sixth frigate, HMS *Gomez Roca*, is scheduled to be commissioned in March 2002. The fifth Dagaie system probably has already been delivered but the sixth systems is expected to be delivered for installation by the end of 1999.

France is also in the process of purchasing five La Fayette frigates to add to its Navy. These five ships are expected to be equipped with two Dagaie Mark 2s. France has already received the first three frigates with the fourth, *Aconit*, scheduled for commission in December 1999, and the fifth, *Guépratte*, scheduled for commission in January 2002. This schedule infers that one Dagaie Mk II system should be delivered before the end of 1999 and one Dagaie Mark 2 system should be delivered in the year 2000.

In addition to Argentina and France, it was also reported, in October 1998, that Morocco is purchasing two Floreal class frigates that will include the Dagaie Mark 2 system. Each of the two frigates, names unknown at this time, is expected to have two Dagaie Mark 2 systems aboard. Although a complete schedule of the program is unverified, the following tentative schedule allows some speculation about the frigate program. The two Floreal class frigates are anticipated to be delivered to Morocco approximately 24 months and 30 months, respectively, after the contract is issued. Work on the two ships was scheduled to commence in mid-1999, and delivery of the first ship was expected at the end of 2000. This suggests that two Dagaie Mark 2 systems will be produced in 1999, and two in 2000, to meet the demand of the Moroccan frigate program.

Saudi Arabia is also reported as being a customer of the Dagaie Mark 2 system. Its new frigate program, three Modified La Fayette class (Type F-3000S) frigates, began in 1989 and was confirmed in 1994. The first two ships were contracted for in November 1994 and the third ship was ordered in May 1997. These three new frigates will include two Dagaie Mark 2 systems per ship. The commissioning schedule for the frigates are as follows: the first frigate is to be commissioned in September 2001, the second frigate is to be commissioned in 2003, and the third frigate is to be commissioned in 2005. In order to meet this need, it is forecast that one Dagaie Mark 2 system will be produced each year from 1999 to 2001, then two systems will be produced in 2002, and finally an additional one will be produced in 2003.

The Sagaie system, although similar to Dagaie, is nearer the end of its production run. The last known procurement of the Sagaie system was from France to be installed on its Charles De Gaulle class aircraft carrier. Four Sagaie systems are expected to be installed, with the last system expected to be produced and delivered for installation by the end of 1999.

Funding

The Dagaie and Sagaie systems were developed under French government contract.

Recent Contracts

No recent contracts have been identified through public sources.

<u>Contractor</u>	<u>Award</u> <u>(\$ millions)</u>	<u>Date/Description</u>
CSEE	N/A	1992 – Seven Dagaie systems to Taiwan.
CSEE	N/A	1994 – Dagaie systems to Qatar for Vita FAC-M.

Timetable

<u>Year</u>	<u>Major Development</u>
1979	Bahrain orders Dagaie for Al Jabiri FAC
1979	Morocco orders Dagaie for Errhamani frigate
1980	Argentina orders Dagaie for MEKO 360 frigates
1980	Argentina orders Dagaie for MEKO 140 frigates
1980	Colombia orders Dagaie for Caldas frigates
1980	Kuwait orders Dagaie for FAC
1980	Saudi Arabia orders Dagaie for Madina frigates
1981	Malaysia orders Dagaie for Lekir frigates
1981	Tunisia orders Dagaie for FAC
1981	Qatar orders Dagaie for first batch FAC

	<u>Year</u>	<u>Major Development</u>
	1982	Qatar orders Dagaie for FAC
	1983	Thailand orders Dagaie for Sukhothai corvettes
	1983	Qatar orders Dagaie for second batch FAC
	1984	Bahrain orders Dagaie for Bans Al Manama FAC
	1985	France orders Sagaie for Suffren
	1985	France orders Sagaie for Clemenceau
	1987	France orders Sagaie for Foch
	1989	France orders Sagaie for Lafayette frigates
	1989	France orders Dagaie for Floreal corvettes
	1990	Torpedo decoy round development revealed
Apr	1990	Fourth Argentinian Espora frigate, <i>Parker</i> , with Dagaie installed commissioned
	1991	France orders Sagaie on De Gaulle aircraft carrier
Late	1993	South Korea orders 3 Okpo class destroyers with Dagaie installed
	1992	Taiwan orders Dagaie
	1994	Qatar orders Dagaie
Nov	1994	Saudi Arabia orders 2 Modified La Fayette class FFG with Dagaie Mk 2 installed
Dec	1997	Saudi Arabia orders 3 rd Modified La Fayette class FFG with Dagaie Mk 2 installed
Mar	1997	France's third La Fayette FFG with Dagaie Mk 2, <i>Courbet</i> , to be commissioned
Jul	98	Kuwait's <i>Um Almaradim</i> Um Almaradim FAC with Dagaie Mk 2 commissioned
Jul	1998	Kuwait's <i>Ouha</i> Um Almaradim class FAC with Dagaie Mk 2 commissioned
Jul	1998	South Korea's <i>King Kwanggeaeto</i> (Okpo class destroyer) commissioned
Oct	1998	Morocco announces purchase of 2 Floreal class frigates with Dagaie Mk 2 installed
Dec	1998	Kuwait's <i>Failaka</i> Um Almaradim class FAC with Dagaie Mk 2 commissioned
Dec	1998	Kuwait's <i>Maskan</i> Um Almaradim class FAC with Dagaie Mk 2 commissioned
Mar	1999	South Korea's <i>Euljimundok</i> (Okpo class destroyer) commissioned
May	1999	Kuwait's <i>Al-Ahmadi</i> Um Almaradim class FAC with Dagaie Mk 2 commissioned
May	1999	Kuwait's <i>Alfhaheel</i> Um Almaradim class FAC with Dagaie Mk 2 commissioned
Mid	1999	Work scheduled to begin on Morocco's 2 Floreal frigates including Dagaie Mk 2
Dec	1999	South Korea's <i>Yangmanchun</i> (Okpo class destroyer) scheduled to be commissioned
Dec	1999	France's fourth La Fayette FFG with Dagaie Mk 2, <i>Aconit</i> , to be commissioned
	2000	Building of first South Korean KDX-2 destroyer expected to begin
Apr	2000	Kuwait's <i>Al Yarmoukl</i> Um Almaradim class FAC scheduled to be commissioned
May	2000	Kuwait's <i>Garoh</i> Um Almaradim class FAC with scheduled to be commissioned
Jun	2000	Fifth Argentinian Espora frigate, <i>Robinson</i> , with Dagaie to be commissioned
Dec	2000	Saudi Arabia's 1 st Modified La Fayette frigate scheduled to begin sea trials
End	2000	1 st Floreal class frigate including Dagaie Mk 2 scheduled for delivery to Morocco
Sep	2001	Saudi Arabia's 1 st Modified La Fayette frigate scheduled to be commissioned
	2002	First four Dagaie Mk 2 systems expected to be installed on first South Korean KDX-2 destroyer
Jan	2002	France's fifth La Fayette FFG with Dagaie Mk 2, <i>Guépratte</i> , to be commissioned
Mar	2002	Sixth Argentinian Espora frigate, <i>Gomez Roca</i> , with Dagaie to be commissioned
	2003	Saudi Arabia's 2 nd Modified La Fayette frigate expected to be commissioned
	2005	Saudi Arabia's 3 rd Modified La Fayette frigate anticipated to be commissioned

Worldwide Distribution

DAGAIE:

- Argentina.** 4 on Almirante Brown (MEKO-360) class destroyers, 6 on Espora (MEKO-140) class frigates, and 3 on Drummond (Type A 69) class frigates.
- Bahrain.** 4 on Ahmad El Fateh (TNC 45) class fast attack craft and 2 on Al Manama (MGB 62) class corvettes.
- Colombia.** 4 on Almirante Padilla class (Type FS 1500) corvettes.
- France.** 4 on Cassard class (Type F 70) destroyers, 26 on D'Estienne D'Orves (Type A 69) class frigates, 6 to 12 Mark 2 on Floreal class frigates, 14 Mark 1 or 2 on Georges Leygues class (Type F 70) destroyers, and 10 Mark 2 on La Fayette class frigates.
- Ghana.** 2 on TNC-57 fast-attack craft.
- Indonesia.** 4 on Singa (PB 57) class (NAV I and II) large patrol craft.
- Italy.** 16 on Maestrale class frigates.
- Kuwait.** 1 on TNC-45 Type fast-attack craft, 1 on FPB 57 Type fast-attack craft, and 16 Mark 2 on Um Almaradim (Combattante I) class fast-attack craft.
- Malaysia.** 4 on Kasturi (Type FS 1500) class corvettes.
- Morocco.** 2 on a Modified Descubierta class frigate and 4 Mark 2 on Floreal class frigates.
- Peru.** 2 on De Ruyter class cruiser.
- Qatar.** 3 on Damsah (Combattante III M) and 4 Mark 2 on Barzan (Vita) class fast-attack craft.
- Saudi Arabia.** 4 on Madina (Type F 2000S) class frigates and 6 Mark 2 on Modified La Fayette Class (Type F 3000S) frigates.
- South Korea.** 12 Mark 2 on Okpo class destroyers, anticipated 12 Mark 2 on KDX-2 destroyers, speculated 12 Mark 2 on KDX-3 destroyers.
- Taiwan.** 12 on Kang Ding (La Fayette) class frigates.
- Thailand.** 2 on Rattanakosin class corvettes.
- Tunisia.** 3 on Combattante III M class fast-attack craft.
- UAE.** 6 on Ban Yaz (YNC 45) class fast-attack craft, 4 on Mubarraz class fast attack craft, and 4 on Murray JIB (MGB 62) class corvettes.

SAGAIE:

- France.** 4 on Cassard class (Type F 70) destroyers, 4 on Charles De Gaulle class aircraft carrier, 2 on Clemenceau class aircraft carrier, and 4 on Suffren class destroyer.
- Italy.** 2 on De La Penne (ex-Animoso) class destroyer.
- Peru.** 1 on De Ruyter class cruiser.

Forecast Rationale

Dagaie is a naval chaff/flare dispensing system that provides infrared flare and chaff cloud decoys. Sagaie uses Dagaie as part of an automated defense system. Numerous countries are currently in possession, or are soon to possess, either the Dagaie or the Sagaie system.

It appears that Kuwait is nearing the end of its Dagaie procurement. Kuwait is reportedly in the process of procuring eight Um Almaradim (Combattante I) class fast-attack craft. These eight ships are expected to each be equipped with two Dagaie Mark 2 systems.

South Korea reportedly has nearly completed its Dagaie Mark 2 procurement for installation on its Okpo (KDX) class destroyers. South Korea reportedly signed contracts for the procurement of three Okpo class destroyers in 1993; however, delays pushed the system back until July 1998 when the first Okpo destroyer,

King Kwanggeaeto, was commissioned. The second destroyer, *Euljimundok*, was commissioned in March 1999, with the third destroyer, *Yangmanchun*, scheduled for commission in December 1999. Also, in February 1999, South Korea signed a contract for three KDX-2 destroyers. It is anticipated that an additional contract will be awarded for three KDX-3 destroyers. Four Dagaie Mark 2 systems might be installed on each of these KDX-2 and KDX-3 ships, therefore raising the projected sales of the system. (The following forecast assumes that all six KDX destroyers will be built.)

Four additional countries are currently in the process of procuring ships that are expected to be equipped with a Dagaie variant. These four countries are Argentina, France, Morocco, and Saudi Arabia.

Argentina is in the advancing its naval fleet with the procurement of six Espora (Meko 140) class frigates. Each of these frigates is expected to be equipped with the Dagaie system. The first four of these frigates were delivered by 1990, and the last two, the HMS *Robinson* and the HMS *Gomez Roca*, are scheduled to be commissioned in June 2000 and in March 2002, respectively. It is fairly likely that the fifth Dagaie system has already been delivered, but the sixth system is expected to be delivered for installation sometime before the end of 1999.

In addition to Argentina, France is in the process of purchasing five La Fayette frigates to add to its naval fleet. Each of these ships is expected to include two Dagaie Mark 2 systems. The first three frigates have already been delivered, with the fourth, *Aconit*, scheduled for commission in December 1999, and the fifth, *Guépratte*, scheduled for commission in January 2002. This schedule infers that one Dagaie Mark 2 system will be delivered before the end of 1999 and one Dagaie Mark 2 system will be delivered during year 2000.

The third country reportedly purchasing a Dagaie variant, in order to be installed on its two new Floreal class frigates, is Morocco. Two Dagaie Mark 2 systems are expected to be installed on each frigate. Work on

the two ships was reportedly scheduled to commence in mid-1999. Delivery of the first frigate is expected by the end of 2000. This sale will provide an additional platform for the Dagaie Mark 2 system and four additional systems are expected to be produced because of it.

Finally, the fourth country reportedly procuring the Dagaie system is Saudi Arabia. Its new frigate program, three Modified La Fayette class (Type F-3000S) frigates, is expected to call for two Dagaie Mark 2 systems per ship. The first frigate is expected to be commissioned in September 2001, the second frigate to in 2003, and the third frigate in 2005. These six Dagaie Mark 2 systems are expected to be produced/completed by 2003.

Previously, it was thought that the Dagaie/Sagaie systems were nearing the end of their production run. However, if the wants/needs of the above five countries are any indication, the Dagaie system might endure throughout the next 10 years. It appears almost certain that the system will be produced throughout the 10-year forecast period and, due to the apparent popularity of the Dagaie Mark 2 system, additional countries will probably procure the system in the future. (Additional sales are extremely speculative and thus not included in the following forecast.)

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	Thru 98	High Confidence Level				Good Confidence Level				Speculative		Total 99-08	
			99	00	01	02	03	04	05	06	07	08		
DAGAIE/SAGAIE	CHAFF/FLARE DISPENSING (ARGENTINA)	12	1	0	0	0	0	0	0	0	0	0	0	1
DAGAIE/SAGAIE	CHAFF/FLARE DISPENSING (FRANCE)	28	1	1	0	0	0	0	0	0	0	0	0	2
DAGAIE/SAGAIE	CHAFF/FLARE DISPENSING SAGAIE (FRANCE)	13	1	0	0	0	0	0	0	0	0	0	0	1
DAGAIE/SAGAIE	CHAFF/FLARE DISPENSING (MOROCCO)	0	2	2	0	0	0	0	0	0	0	0	0	4
DAGAIE/SAGAIE	CHAFF/FLARE DISPENSING (SAUDI ARABIA)	0	1	1	1	2	1	0	0	0	0	0	0	6
DAGAIE/SAGAIE	CHAFF/FLARE DISPENSING (SOUTH KOREA)	12	0	0	0	0	4	4	4	4	4	4	4	24
DAGAIE/SAGAIE	Prior Prod'n:	139	0	0	0	0	0	0	0	0	0	0	0	0
Total Production		204	6	4	1	2	5	4	4	4	4	4	4	38