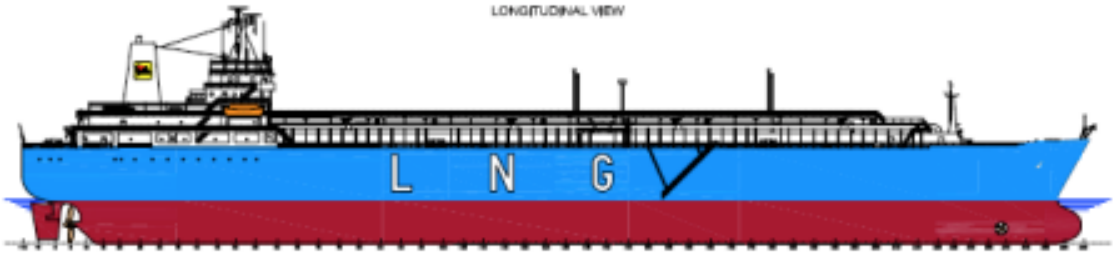
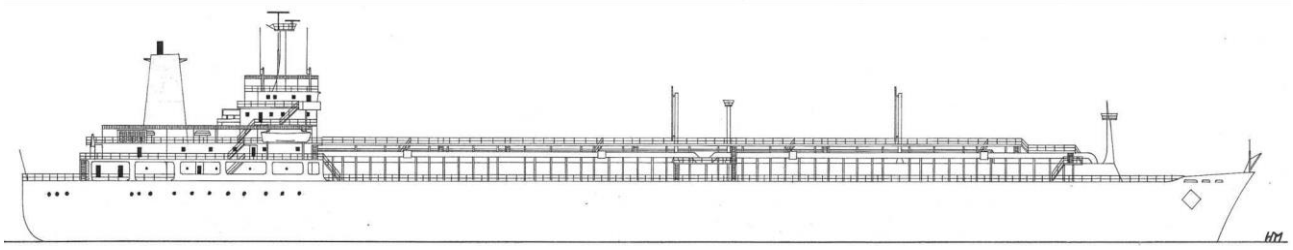
Le navi metaniere da 40.000 mc.



An LNGC quartet like no other



PREMESSA

Quando parliamo delle "40.000" tutti noi, vecchi della SNAM, sappiamo di parlare delle navi metaniere ESSO BREGA, ESSO LIGURIA, ESSO PORTOVENERE e della LAIETA.
Quattro navi, costruite alla fine degli anni Sessanta, che fanno parte, a tutto diritto, della storia del trasporto del metano via mare.

AN LNGC QUARTET LIKE NO OTHER è il titolo di un articolo pubblicato sul LNG WORLD SHIPPING JOURNAL, nel Novembre 2012 quando l'ultima nave della serie fu avviata alla demolizione. Tanto era importante la storia di queste navi da meritare un articolo commemorativo su una importante rivista del settore.

La mia intenzione è ripercorrere brevemente la storia di queste quattro unità, con maggiore attenzione e particolari, nei confronti della ESSO BREGA ed ESSO LIGURIA. che sono state le due navi, che nel 1986, furono acquistate e poi gestite dalla SNAM.

UN PO' DI STORIA - ESSO INTERNATIONAL

Le navi furono costruite dalla ESSO per il trasporto del GNL, dalla Libia e dall'Algeria, al terminale di Panigalia ed ai terminali spagnoli.
Le tre navi ESSO furono costruite tra il 1969 ed il 1970 presso lo stabilimento Italcantieri di Sestri Ponente e la LAIETA presso il cantiere Astano di El Ferrol.
Le navi erano, allora, le più grandi metaniere del mondo.

Va ricordato che il numero totale di navi esistenti per il trasporto del GNL era, nel 1970, inferiore alle 15 unità per cui il progetto di costruzione e la realizzazione di queste unità furono qualcosa di avveniristico e, tecnologicamente, estremamente avanzato considerati gli anni di cui stiamo parlando.

La progettazione del sistema di contenimento del GNL era la sfida maggiore che i progettisti dovettero affrontare per la loro realizzazione.
I serbatoi prismatici di tipo CONCH erano in lega di alluminio 5083, costruiti dalla Chicago Bridge & Iron, con paratia longitudinale e doppia intercapedine.

La costruzione dello scafo e dei serbatoi riflette l'approccio estremamente cautelativo che la ESSO, i Cantieri di Costruzione e gli Enti di Classifica adottarono nella realizzazione delle navi. Il risultato fu che queste unità possono essere, tuttora, considerate le LNG più robuste mai costruite.

Le quattro navi, per quanto ci risulta, furono impiegate ininterrottamente dal 1972 al 1980. Da dati in nostro possesso possiamo ipotizzare che i viaggi portati, singolarmente, a termine dalle quattro unità siano stati circa 300.

A partire dal 1980 - 1981 le tre navi della ESSO furono messe in disarmo, nella rada della Spezia la ESSO BREGA ed ESSO LIGURIA, ed al campo boe Italcantieri di Sestri la ESSO PORTOVENERE.

La LAIETA, che era di proprietà della Marittima del Norte e di bandiera spagnola, continuò ad operare con i terminali algerini per conto della neonata ENAGAS.

Nel 1984 la ESSO BREGA e la ESSO LIGURIA furono acquistate dalla SNAM e la ESSO PORTOVENERE fu venduta per la demolizione.

Le due navi furono ribattezzate SNAM PALMARIA e SNAM ELBA ed a partire dal 1985 iniziarono ad essere impiegate, saltuariamente, sulle rotte del Nord Africa con discarica a Panigalia, Barcellona, Huelva.

Le navi, dopo un primo periodo di scarso impiego ed interesse da parte della SNAM, iniziarono, dagli anni Novanta, ad essere impiegate con maggiore frequenza, anche in viaggi per conto terzi, e di conseguenza l'impegno a mantenerle in piena efficienza aumentò considerevolmente. Incominciarono allora ad essere necessari alcuni interventi per adeguare le unità alle nuove normative internazionali in vigore ed alle raccomandazioni SIGTTO che nel frattempo erano state recepite dagli tutti gli operatori del GNL.

La flotta mondiale di LNGC era nel frattempo più che raddoppiata e, di conseguenza, l'attenzione verso questo mercato era fortemente aumentata.
Gli anni Novanta segnarono il punto di svolta per il mercato del trasporto via mare del GNL e conseguentemente le navi furono adeguate ai nuovi standard.

Mi piace ricordare che, alla presa in carico delle due navi, fu designato, come ispettore, Giampiero Adami che di quelle navi era stato Direttore di Macchina avendole "prese in carico" sin dalla costruzione a Sestri Ponente da giovane ufficiale. Dopo una carriera in Esso, da marittimo, era già da tempo in forza al Servizio Tecnico della Snam e quelle due navi le seguirà fino al suo pensionamento.

La ESSO BREGA, ora SNAM PALMARIA, era stata progettata e costruita anche per il trasporto di GPL. Un compressore alternativo e i relativi accessori erano stati sistemati in un locale dedicato sistemato sul ponte di coperta. Non ci risulta che l' impianto sia mai stato utilizzato, tuttavia l'ipotesi di adeguare la nave al trasporto di GPL fu presa in considerazione e fu commissionato uno studio di fattibilità per l'adeguamento degli impianti GPL alle nuove esigenze e normative internazionali. . Il costo per l'adeguamento fu quantificato, nel 1992 in 1.200 ML di Lire in considerazione del fatto che l'impianto andava raddoppiato per ottemperare alle normative ed ai nuovi regolamenti di classe.
L' interesse per un eventuale trasporto di GPL svani per un sempre maggiore impiego nel trasporto di GNL che, a partire dalla metà degli anni Novanta, si sviluppò in maniera significativa.

Nel 1994 ambedue le navi furono sottoposte ad estesi lavori di manutenzione e adeguamento impianti nell'ottica di ottenere una certificazione, da parte dei Registri di Classifica che ne convalidasse la Classe e permettesse di estendere la vita delle due navi oltre i limiti presi in considerazione al momento della costruzione. A seguito delle visite e della verifica strutturale delle due navi, gli enti di classifica Rina/ABS rilasciarono una certificazione per un "ringiovanimento convenzionale", così allora veniva chiamato. di 20 anni. Tale certificazione garantiva la possibilità di operare con le navi sino al 2014, in totale sicurezza, per quanto relativo alla robustezza dello scafo e dei serbatoi del carico.

Nella costruzione delle navi era stato fatto ampio uso, sia in locale motore che negli alloggi, di amianto. Tutte gli isolamenti termici dei macchinari, dei tubi, delle paratie tagliafuoco, le pannellature negli alloggi, locali comuni etc. erano a base di materiali contenenti amianto.
All' inizio degli anni Novanta con la entrata in vigore della Legge 272 l'amianto fu bandito dalle navi e laddove esistente furono previste azioni conservative e procedure per l'eventuale manipolazione.

Le due navi furono completamente disarmate e la decontaminazione fu commissionata ad una ditta specializzata. Durante i lavori di rimozione e decontaminazione il personale marittimo poteva accedere a bordo con procedure approvate dall' Autorità Marittima e solo per garantire la sicurezza della nave. Furono rimosse centinaia di tonnellate di amianto e rinnovati gli isolamenti termici con materiali approvati. Ovviamente non tutto l'amianto poté essere rimosso ed una identificazione e

mappatura del restante fu commissionata e prodotta da una ditta specializzata. Le due navi furono le prime unità di bandiera italiana ad avere, su base volontaria, il Green Passport, rilasciato dal Rina, che identificava l'amianto ed altri materiali tossico nocivi esistenti a bordo.

Sempre in un'ottica di potenziamento degli impianti fu installato in un container nella zona alloggi, un diesel generatore da 1000 KW. Il nuovo D)G venne collegato al quadro elettrico di distribuzione e consentì di operare con maggiore sicurezza e flessibilità.
L'operazione di potenziamento dell' impianto di generazione elettrica era già stata affrontata sulla LAIETÀ quando, per un'avaria ad un turbogeneratore, la nave si trovò improvvisamente inoperativa vista la difficoltà di reperire i materiali di rispetto per la manutenzione della macchina. La soluzione operata dagli Armatori fu di installare un D/G in Locale Apparato Motore e più precisamente nel locale officina meccanica.

Alla fine degli anni Novanta si rese necessario affrontare il problema della degassifica e successiva inertizzazione delle navi. Da sempre il riscaldamento delle cisterne veniva fatto con l'ausilio di un compressore a vapore che era a disposizione delle due navi SNAM e, per accordi intercorsi con l'armatore, della LAIETÀ. Aldilà dei problemi logistici che lo spostamento del compressore tra Italia e Spagna comportava, dopo ogni degassifica immancabilmente andava manutenzionato e messo in stato di conservazione con costi da condividere con l'Armatore spagnolo.
Una volta effettuato il riscaldamento delle cisterne le stesse andavano azotate, operazione che veniva portata a termine al pontile di Panigalia con oneri e problematiche di carattere organizzativo non indifferenti. Inoltre. i regolamenti portuali che in passato consentivano lo spiazzamento del GNL con scarico all'atmosfera, erano stati implementati dalle nuove direttive Europee per cui fu giocoforza realizzare un sistema autonomo per la produzione di gas inerte.
Il nuovo sistema di generazione di gas inerte fu realizzato con un generatore, autonomo, di azoto che, cosi come fu progettato, permetteva di degassificare la nave in 4/5 giorni e di rimettere le cisterne in gas inerte in altrettanti. L'impianto, che era sistemato in un container sul ponte lance, si rivelò un'ottima e funzionale realizzazione che rese la nave indipendente dalle esigenze operative del terminale di Panigalia.

Nell'ottica di adeguamento del sistema CCTS (Cargo Control Transfer System) su ambedue le navi fu installato un nuovo sistema di rilevamento del livello del carico. Furono le prime navi LNG ad installare sonde radar su serbatoi strutturati. Il lavoro comportava al di la dei problemi hardware un lavoro di calibrazione del software per la presenza nelle cisterne delle strutture di rinforzo. L' AUTRONICA, fornitrice del sistema, riconobbe di aver fatto una eccellente esperienza che fu propedeutica alla fornitura di impianti analoghi su nuove costruzioni.

Nel 2005 le due navi furono le prime navi italiane ad ottemperare alla European Directive 2005/33/CE riguardante le emissioni di SO2 ed il conseguente impiego di combustibili meno inquinanti.

Sempre in un'ottica di adeguamento delle navi alle raccomandazioni emesse dalla SIGTTO, i manifolds del carico furono modificati e resi compatibili con i nuovi terminali LNG che, nel frattempo, erano stati costruiti. L' operazione fu tutt'altro che di facile realizzazione in quanto si dovettero rifare tutti i calcoli sulle dilatazioni delle tubolature, rinnovare e modificare le stesse con impiego di materiali criogenici certificati ed infine riposizionare i punti di scorrimento.

Mi preme anche ricordare che, a corollario di tutte le modifiche apportate alle navi, fu installata in LAM una "cabina" condizionata, nella quale furono portati gli allarmi, al fine di permettere al personale di guardia di operare in un ambiente più confortevole. Riconosco tuttavia che fu una scelta più politicamente che tecnicamente valida.

Le due unità continueranno ad operare fino al 2012 dopo essere state incorporate nella nuova società LNG SHIPPING ed essere state ribattezzate LNG Palmaria ed LNG Elba.

CONCLUSIONE

Nel 2012 le navi furono alienate per sopraggiunti limiti di età. Le considerazioni che portarono alla loro alienazione furono più "politiche" che tecniche. La presenza di amianto a bordo, l'età anagrafica, la difficolta di reperire materiali di rispetto per i macchinari critici ed altre valutazioni di carattere commerciale ne decisero la fine.

Le due navi, che tutto erano meno che due vecchie "carrette" furono demolite in Turchia.
Mi piace ricordare che furono le prime due navi ad essere "DECOMMISSIONED" prima della demolizione. Vale a dire che prima di andare nel cantiere di demolizione tutto l'amianto, materiali tossico nocivi, pitture, solventi e quanto altro incluso in quel Green Passport di cui prima accennavo furono rimossi ed alienati secondo le normative Europee.

Tutto ciò è per noi tutti, che partecipammo a quel progetto, motivo di orgoglio per essere stati i primi in Italia e fra i primi in Europa a farlo. Ben più spazio mediatico ebbe la COSTA CONCORDIA per aver fatto le stesse cose.

Voglio ancora ricordare come il colore dell'opera viva delle due navi sia stato ripetutamente "aggiornato" passando dal bellissimo grigio piombo della Esso al nero della Snam per concludere con il blu elettrico della LNG Shipping. Anche le sovrastrutture passarono dal bianco all'avorio, così detto Snam, poi nuovamente al bianco.

Cambiarono anche le insegne del fumaiolo, ma questa è tutta un'altra storia.

Walter Weber
Genova, 2021

ALLEGATI

- ABSTRACT LNG 12 International Conference & Exhibition on Liquefied Natural Gas
- Storia Commerciale delle Navi Snam
- Memorandum impiego navi Metaniere dal 1984 al 2003
- Vessel Trading History on Esso account
- An LNGC quartet like no other by Mike Corkhill

LNG ELBA - A CASE OF REJUVENATION
LNG ELBA - UN EXAMPLE DE RAJEUNESSIMENT

ABSTRACT
The methane carrier LNG ELBA had been in service for more than 25 years. In view of the excellent condition and performance of the vessel, the Owners decided to investigate the possibility of a 10 years extension of life by means of a rejuvenation programme.
This paper discusses some of the technical and structural work that permitted the successful completion of the project.

RESUME
Le méthanier LNG ELBA était en service depuis 25 ans. Considerant le très bon état et les excellentes performances du navire, l'armateur a décidé d'étudier la possibilité d'en prolonger la durée de vie pour une période de 10 ans, grace à un programme de rajeunissement. Ce rapport décrit les travaux techniques et structurels qui ont permis de mener à bien le projet.

INTRODUCTION
The steam ship LNG ELBA was delivered to the Owners in 1970 and had therefore been in operation for 25 years when SNAM decided to evaluate the possibility to maintain it in service for a further period of 10 years.
The reason why SNAM come to consider this possibility was that the LNG ELBA and her sister ship were built to the highest standards and no structural or containment problems were recorded during the service period.

The vessel was classified with RINA (REGISTRO ITALIANO NAVALE) and ABS (AMERICAN BUREAU OF SHIPPING). SNAM decided to verify with both the Classification Societies the feasibility of the project and the requirements for a longevity and life extension study.

The Societies requirements were particularly restrictive, allowing a maximum of 10 % of wastage in thickness and considering the integrity of ballast tanks coating compulsory.
Taking into account this first major item, SNAM identified the other areas in which work was necessary for the vessel to be employed the for the desired period.
Two major areas were identified:

- Spare parts requirements and obsolete machinery and equipment to be renewed.
- Compliance with new international statutory and commercial requirements.

The first phase of the project was a feasibility study. The executive project was launched at the beginning of 1996, with the shopping list of equipment and specification for the yards.
Bid offers were requested according to ECC (European Community) requirements from yards of the Mediterranean area and finally the ship was assigned to S. Giorgio del Porto of Genoa.

The ship was laid up in La Spezia and, in the time required for the purchasing of the materials and equipment, all the asbestos insulation on pipes and machinery in E.R. was removed in order to comply with Italian Government recommendations on the matter.
The operation was completed in 80 days, with total removal and disposal of the asbestos. The total amount of asbestos removed was around 200 CM.
The engine room was completely cleaned and decontaminated before the transfer of the vessel to the yard.

The vessel was transferred from La Spezia to Genoa and moored at S. Giorgio shipyard where she stayed from September 1 to January 15, 1997, when she went out for sea trials.
All scheduled repairs and modifications were successfully carried out in that time, without exceeding the original budget.

SHIP GENERAL DESCRIPTION - S.S. LNG ELBA (EX ESSO LIGURIA)

TYPE: Single screw steel gas carrier, carriage in bulk in large independent tanks permanently fitted on board of hydrocarbon gases liquefied by refrigerating in accordance with the relevant "Certificate of Fitness"

PROPULSION MACHINEY:	TWO MAIN STEAM TURBINE (H.P & L.P.) TYPE DE LAVAL, 15.000 HP AT 105 RPM- BUILT BY ANSALDO MECCANICO, GENOA ITALY IN 1970.
PROPELLER:	ONE FOUR BLADED BRONZE PROPELLER DIAMETER 6553MM. BOW THRUSTER.
SHAFTING :	ONE STEEL OIL LUBRICATED TAILSHAFT. OIL SEAL ASSEMBLIES TYPE SIMPLEX
GENERATORS :	TWO TURBO DRIVEN ELECTRIC GENERATORS 820 KVA EACH.ONE EMERGENCY DIESEL DRIVEN ELECTRIC GENERATOR 375 KVA. TOTAL OUTPUT 4015 KVA.
BOILERS :	TWO MAIN BOILERS, FOSTER WHEELER TYPE WATER TUBE, FUEL OIL OR METHANE. STEAM OUTPUT: 2 X 34 T/H. WORKING PRESSURE: 43.2 KG/CM2. BOILERS BUILT BY ANSALDO MECCANICO, GENOA

LONGEVITY / LIFE EXTENSION STUDY

A study commissioned to ABS for the rejuvenation work revealed that the original design of the ''LNG ELBA'' had been excellent and technically very advanced. In fact, vessels of the same type built since include mostly minor improvements and modifications, regarding mainly propulsion efficiency, hull design, etc. Good design and sound construction can therefore be considered as the basis for the ship's impressive operational record and present good condition.

The condition assessment survey concluded that not only had the vessel been built to high standards of quality and in full compliance with the standards and specifications in force at the time of construction, but that it even complied with present-day requirements. The survey also noted that ''additional strength capacity is provided due to a conservative design and the fact that the original design analysis was based on North Atlantic conditions while the vessel traded mostly in conditions found in the Mediterranean area''.

The study included an extensive review of the vessel's history, which failed to identify any significant technical problems, leading to the conclusion that any adverse ageing effects had been adequately counteracted.
The rejuvenation process included a general overhauling of the vessel's structure and technical equipment and the following targeted interventions:

1. SCANTLING EVALUATION AND CORROSION PREVENTION

The results of the survey's structural analysis as projected for the service life of the scantlings of the 10 and 15 year term, showed that the minimum life span is 13.2 years for the deck plating members. All other structural members of the vessel as evaluated were deemed sound also for the 15-year life span projection without renewal requirements.

In view of the sound structural condition of the vessel, corrosion prevention is considered to be an important element in terms of longevity with regard to maintaining structural strength. The projected service life of individual members has been calculated assuming the structure will continue to corrode at its present rate.

2. BALLAST TANKS STEEL RENEWAL AND RECOATING

The ballast tanks, cofferdam, void spaces etc. were carefully inspected and gauged as required by Classification Societies taking into consideration that the maximum allowed steel wastage allowed by RINA was 10 % of original scantling.

The total amount of steel renewed (only in cofferdam n. 5) was less than 5 tons, indicating that the original coating was still in good condition and the vessel had been maintained as new.
The ballast tanks and cofferdams were HP hydro blasted and recoated as necessary to maintain an effective corrosion prevention for the remaining life of the vessel; 45.000 sqm were completely recoated.

3. CARGO MANAGEMENT SYSTEM

Several items of equipment and machinery were maintained and updated according to new terminal requirements and regulations, including:

- Renewal of all the electric cables of cargo pumps.
- Installation of a new ESD system (SIGGTO approved).
- Recalibration of all cargo instrumentations.
- Installation of a new computerised control in CCR as back up for the existing recorder system.
- Verification of cargo tanks insulation.

- Necessary repairs on deck domes insulation.

4. MACHINERY AND ELECTRICAL INSTALLATION

In order to comply with USCG regulations concerning discharge of methane to the atmosphere and permit to burn the boil off in the main boilers when the vessel is idling at anchor, a steam dumping system to the main condenser was installed, with the relevant control devices.

Moreover, the following interventions were carried out in ER and on deck machinery:

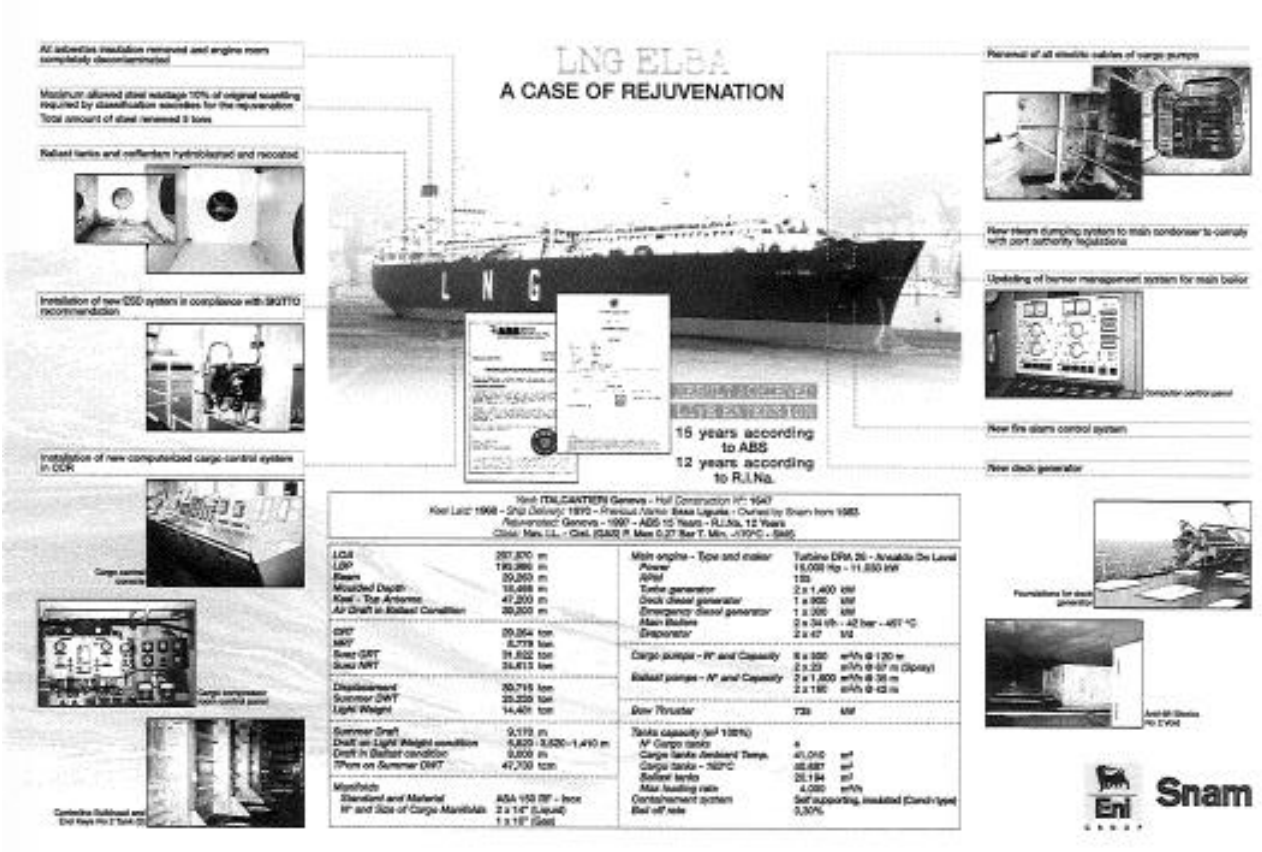
- New containerised 350 KVA Diesel generator installed on lifeboats deckas port generator
- New electric switchboard and cables provided for installation of a 1200 containerised KVA Diesel Generator in case of failure of one of the existing turbogenerators in ER.
  This decision was taken due to the difficulty to provide for spare parts for the two turbines in a short time, the original supplier having gone out of business.
- Extensive routine maintenance to all machinery.
- Updating of the burner management system for the main boilers with an extensive retrofitting.
- All main condenser tubes were internally inspected, hydro blasted and coated with a 25 micron film to ensure effective corrosion protection.
- A new fire alarm system, not required by SOLAS, was installed to comply with the new international requirement.
- GMDSS and towing arrangement were installed to comply with IMO requirements.

CONCLUSIONS

The rejuvenation of vessel, drydock maintenance, scheduled and unscheduled maintenance and retrofitting were carried out in time and within budget.
The vessel has been rejuvenated by both the RINA and ABS and evaluated to be safe to trade until the year 2011 for the ABS and 2008 for the flag Classification Society (RINA) that not allow to have a rejuvenation of more than 50% of the life of vessel.

SNAM has always attached great importance to the proper technical care of its fleet. The successful rejuvenation of the LNG ELBA clearly indicates that a company policy of prevention, planned maintenance and updating of equipment is an efficient way to counteract the effects of ageing, such as wear and tear and corrosion.
The Company however is also fully aware of the importance of the human element in the running of its vessels. It has therefore taken steps to minimize the risks due to possible human errors, by enforcing high operational standards and procedures and the use of skilled personnel with adequate training in the operation of gas carriers. Training courses for crew and officers are held in our own Training Centre and cover all aspects of vessel operation.
Given the success of the LNG ELBA project, the same rejuvenation programme is now being applied to her sister ship, the LNG PALMARIA.

Walter Weber, SNAM Trasporti Marittimi
LNG 12 Perth, Australia



LE NAVI DELLA SERIE ESSO BREGA

NOME	CANTIERE	ANNO DI COSTRUZIONE	N° COSTRUZIONE	ANNO DI ALIENAZIONE
ESSO BREGA	ITALCANTIERI SESTRI	1969	1646	2012
ESSO LIGURIA	ITALCANTIERI SESTRI	1970	1645	2012
ESSO PORTOVENERE	ITALCANTIERI SESTRI	1970	1647	1986
LAIETA	ASTANO EL FERROL	1970	211	2008

TONS	30.500	CARGO CAPACITY	41.000
DWT	25.400	# OF TANK	4
LENGTH OVERALL	208	SPEED	18.5
LPP	196	HORSE POWER	15.000
BEAM	29.3	SUMME DROUGT	9.17

Le navi costruite in Italia erano classificate con il RINA/ABS.
La LAIETA era in classe con il LLOYD REGISTER.

ESSO BREGA - IMO N° 6905616

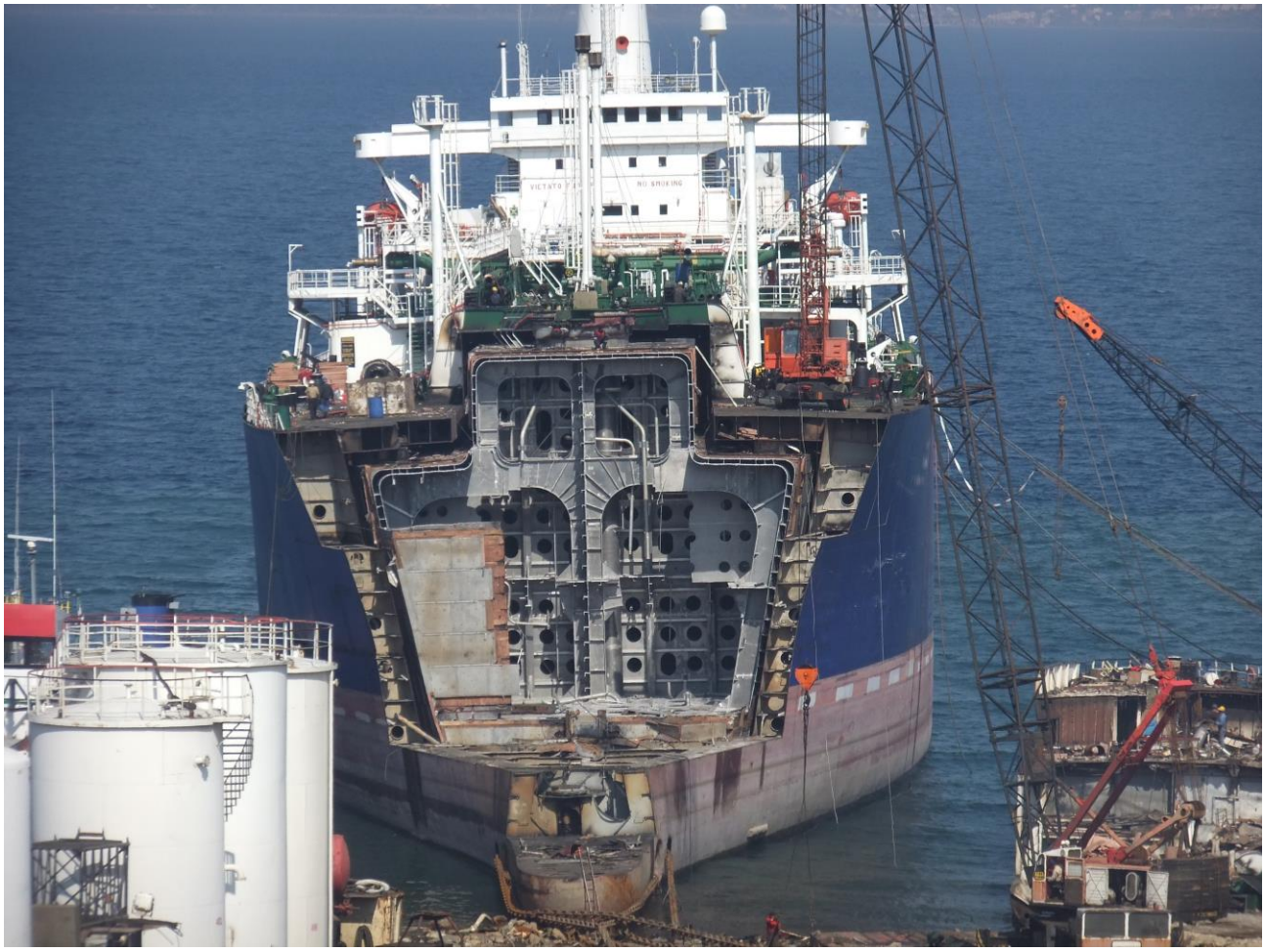
Name	Change	Registered Owner	Port
ESSO BREGA		"La Prora" SpA Trasporti	ITA Palermo
ESSO BREGA	1981	Esso Tpt Co Inc	ITA Palermo
SNAM PALMARIA	1984	SNAM SpA	ITA Genoa
LNG PALMARIA	1999	SNAM SpA	ITA Palermo
LNG PALMARIA	2005	LNG Sg SpA	ITA La Spezia

Disposal Data: BU Aliaga 25.2.12 [Cemsan]

ESSO BREGA

SNAM PALMARIA

LNG PALMARIA



LNG PALMARIA AD ALIAGA

ESSO PORTOVENERE - IMO N° 6905616

Name	Change	Registered Owner	Port
ESSO PORTOVENERE		"La Prora" SpA Trasporti	ITA Palermo
ESSO PORTOVENERE	1981	Esso Tpt Co Inc	ITA Palermo
ESSO PORTOVENERE	1984A	Gestioni Servizi Patrimoniali SpA	ITA Genoa
PORTOVENERE	1984B		HND

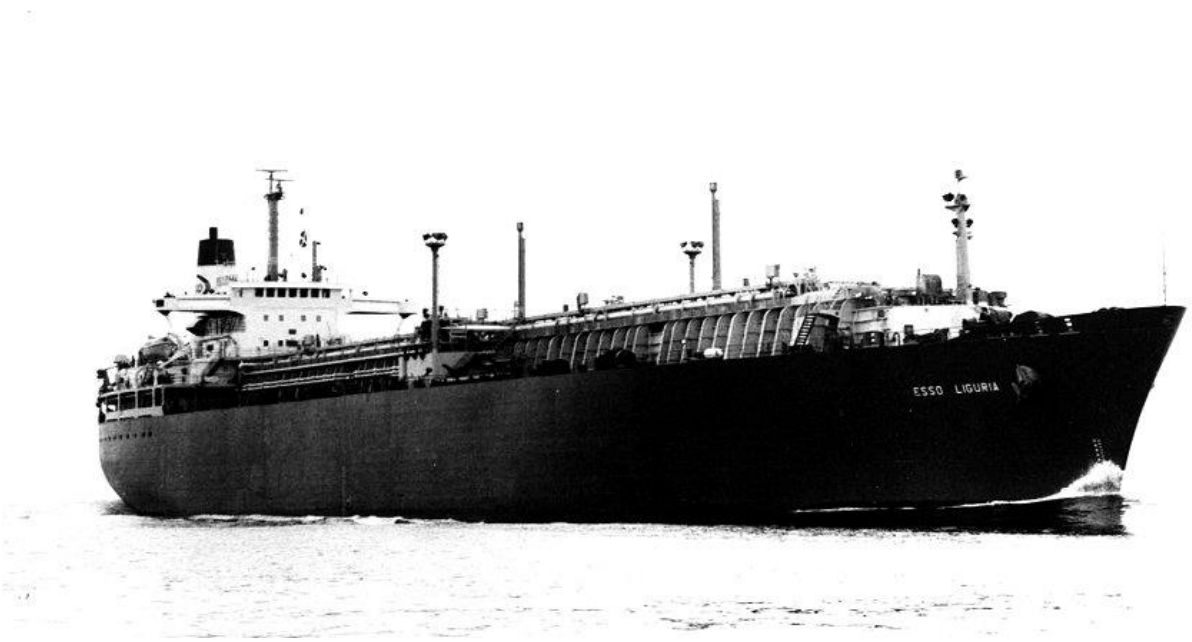
Disposal Data: BU Kaohsiung 7.3.85, work began 26.3.85 [Chi Shun Hwa Steel Co]. The transfer was mad by Wijsmuller Bros., The Hague, Netherlands, under the flag of Honduras.

ESSO Portovenere

ESSO LIGURIA - IMO N° 6928632

Name	Change	Registered Owner	Port
ESSO LIGURIA		"La Prora" SpA Trasporti	ITA Palermo
ESSO LIGURIA	1981	Esso Tpt Co Inc	ITA Palermo
SNAM ELBA	1984	SNAM SpA	ITA Genoa
LNG ELBA	1997	SNAM SpA	ITA Palermo
LNG ELBA	2002	LNG Sg SpA	ITA La Spez

Disposal Data: BU Aliaga 12.7.12 [Cemsan



ESSO Liguria

SNAM Elba

LNG ELBA

LNG ELBA AD ALIAGA

LAIETA - IMO N° 6904442

Name	Change	Registered Owner	Port
LAIETA		Naviera de Productos Licuados SA	ESP Barcelona
LAIETA	1990	Maritima del Norte (Panama) SA	PAN Panama
LAIETA	2007	Maritima del Norte Corp	SKN

Disposal Data: BU Chittagong 25.8.08 & beached 4.9.08

https://www.shipsnostalgia.com/gallery/showphoto.php/photo/202672/title/laieta/cat/528

YEAR	N° VOYAGE ON TRADING AREAS				TOTAL ROUND TRIPS
	LIBYA/ITALY	SKIKDA/ITALY	LIBYA/BARCELONA	LIBYA/HUELVA	
1970					0
1971			2		2
1972	20		8		28
1973	24		6		30
1974	21		5		26
1975	27		6		33
1976	27		12		39
1977	29		5		34
1978	24		10		34
1979	22		14		36
1980	15		6		21
1981					0
	209	**0**	**74**	**0**	**283**

NOTA : DATI ESTRATTI DA "LNG LOG 24" SIGTTO (JANUARY 2000)

ESSO BREGA (LNG PALMARIA)

VESSEL TRADING HISTORY ON ESSO ACCOUNT

YEAR	N° VOYAGE ON TRADING AREAS				TOTAL ROUND TRIPS
	LIBYA/ITALY	SKIKDA/ITALY	LIBYA/BARCELONA	LIBYA/HUELVA	
1970					1
1971	4		7	1	11
1972	11		10		21
1973	18		13		31
1974	25		3		28
1975	21		8		29
1976	23		14		37
1977	16	2	7		25
1978	27		12		39
1979	19		11		30
1980	15		9		24
1981			10		10
	179	**2**	**104**	**1**	**286**

NOTA : DATI ESTRATTI DA "LNG LOG 24" SIGTTO (JANUARY 2000)

LNG PALMARIA					
PERIODO		GIORNI	TIPO IMPIEGO / POSIZIONE		
21/04/84	07/06/84	47	RITIRI	SNAM	
07/06/84	01/10/84	116	DEGASIFICA	DISARMO	LA SPEZIA
01/10/84	20/03/85	169	RITIRI	SNAM	
20/03/85	25/10/88	1.316	DEGASIFICA	DISARMO	LA SPEZIA
25/10/88	14/04/89	171	RITIRI	SNAM	
14/04/89	12/05/89	28	DEGASIFICA	DISARMO	LA SPEZIA
12/05/89	02/07/89	51	GAS DE FR.	T/CHARTER	11/05/89
02/07/89	26/11/89	147	DEGASIFICA	DISARMO	LA SPEZIA
26/11/89	07/04/90	132	ENAGAS	T/CHARTER	17/11/89
07/04/90	08/11/91	580	ENAGAS	T/CHARTER	17/03/89
08/11/91	11/12/91	33	RITIRI	SNAM	
11/12/91	15/12/91	4	C/P 04/12/91	SPOT	ENAGAS
15/12/91	08/07/92	206	RITIRI	SNAM	
08/07/92	12/10/92	96	DEGASIFICA	DISARMO	LA SPEZIA
12/10/92	15/04/93	185	RITIRI	SNAM	
15/04/93	21/04/93	6	C/P 01/04/93	SPOT	ENAGAS
21/04/93	28/04/93	7	RITIRI	SNAM	
28/04/93	03/05/93	5	C/P 01/04/93	SPOT	ENAGAS
03/05/93	10/06/93	38	RITIRI	SNAM	
10/06/93	02/10/95	844	DEGASIFICA	DISARMO	GE / SP
02/10/95	04/06/96	246	ENAGAS	T/CHARTER	15/06/95
04/06/96	05/11/96	154	DEGASIFICA	DISARMO	LA SPEZIA
05/11/96	05/02/97	92	ENAGAS	T/CHARTER	16/07/96
05/02/97	20/07/97	165	RITIRI	SNAM	
20/07/97	15/10/98	452	DEGASIFICA	LAVORI	GENOVA
15/10/98	12/01/00	454	GDF	T/CHARTER	23/07/98
12/01/00	15/11/00	308	DEGASIFICA	DISARMO	GENOVA
15/11/00	21/11/01	371	GENOVA	STAND BY	ORDINI
21/11/01	01/01/03	406	RITIRI	ENI	
TIME CHARTER SNAM/ENI	TIME CHARTER TERZI	VIAGGI SPOT	ATTESA ORDINI NAVE ARMATA	DEGASIFICA / DISARMO LAVORI	
1.428	1.555	15	371	3.460	
TOTALE	IMPIEGO COMMERCIALE			LAVORI / DISARMO	
6.828	2.997		44%	3.831	56%

TOTALE VIAGGI ESEGUITI 353

LNG ELBA					
PERIODO		GIORNI	TIPO IMPIEGO / POSIZIONE		
DAL	AL		NAVE ACQISTATA NEL 1983		
22/01/85	05/05/85	103	RITIRI	SNAM	
05/05/85	25/11/85	204	DEGASIFICA	DISARMO	LA SPEZIA
25/11/85	20/03/86	115	SNTM HYPR.	T/CHARTER	21/11/85
20/03/86	31/05/86	73	LA SPEZIA	STAND BY	ORDINI
31/05/86	01/09/88	823	DEGASIFICA	DISARMO	LA SPEZIA
01/09/88	09/03/90	554	ENAGAS	T/CHARTER	17/03/88
09/03/90	15/03/90	6	RITIRI	SNAM	
15/03/90	07/04/90	23	ENAGAS	T/CHARTER	17/03/88
07/04/90	09/10/90	185	DEGASIFICA	DISARMO	LA SPEZIA
09/10/90	09/01/91	92	ENAGAS	T/CHARTER	02/10/90
09/01/91	23/09/91	257	DEGASIFICA	DISARMO	LA SPEZIA
23/09/91	08/11/91	46	RITIRI	SNAM	
08/11/91	09/03/93	487	ENAGAS	T/CHARTER	17/03/88
09/03/93	02/05/93	54	DEGASIFICA	LAVORI	LIVORNO
02/05/93	04/06/93	33	ENAGAS	T/CHARTER	26/04/93
04/06/93	07/01/95	582	RITIRI	SNAM	
07/01/95	23/02/95	47	GAS DE FR.	T/CHARTER	06/01/95
23/02/95	06/03/95	11	C/P 18.11.93	SPOT	ENAGAS
06/03/95	05/04/95	30	LA SPEZIA	STAND BY	ORDINI
05/04/95	01/09/95	150	DEGASIFICA	DISARMO	LA SPEZIA
01/09/95	04/04/96	216	ENAGAS	T/CHARTER	15/06/95
04/04/96	24/01/97	295	DEGASIFICA	DISARMO	GENOVA
24/01/97	07/06/97	134	RITIRI	SNAM	
07/06/97	28/06/97	21	LA SPEZIA	STAND BY	ORDINI
28/06/97	28/08/97	61	DEGASIFICA	LAVORI	GENOVA
28/08/97	22/10/98	420	G D F	T/CHARTER	01/07/97
22/10/98	08/01/99	78	DEGASIFICA	LAVORI	GENOVA
08/01/99	12/01/00	368	ENAGAS	T/CHARTER	02/06/97
12/01/00	05/05/01	479	GDF	T/CHARTER	23/07/98
05/05/01	14/07/01	71	DEGASIFICA	LAVORI	GENOVA
14/07/01	27/05/03	681	GDF	T/CHARTER	23/07/98
TIME CHARTER SNAM/ENI	TIME CHARTER TERZI	VIAGGI SPOT	ATTESA ORDINI NAVE ARMATA	DEGASIFICA / DISARMO LAVORI	
870	3.515	11	123	2.179	
TOTALE	IMPIEGO COMMERCIALE			LAVORI / DISARMO	
6.699	4.397		66%	2.302	34%

TOTALE VIAGGI ESEGUITI 519

IL RIASSUNTO DEI TEMPI DI UTILIZZO DELLE NAVI SI FERMA AL PASSAGGIO DELLE STESSE DA ENI G&P A LNG SHIPPING

An LNGC quartet like no other

Syd Harris reflects on the long working lives of the unique *Esso Brega* series of LNG carriers and his own experiences of these ships

LNG WORLD SHIPPING SEPTEMBER/OCTOBER 2012

The breaking up of the 41,000m3 LNG carrier pair LNG Palmaria and LNG Elba at a Turkish yard earlier this year marked the end of one of the longest-running stories in LNG shipping. LNG Palmaria, delivered as Esso Brega and the lead vessel in a four-ship series, completed 43 years in service and holds the record for the longest trading LNG carrier jointly with the 25,500m3 Cinderella, ex-Jules Verne. Cinderella had independent cylindrical cargo tanks and was broken up in 2008.

The origins of LNG Palmaria and her sisters go back to the late 1960s, when Esso International developed its own independent cargo tank design for four 41,000m3 vessels needed to transport LNG from Libya to Italy and Spain. The size of the ships was deemed right for the cross-Mediterranean trades at the time.

During 1969 and 1970 Italcantieri's Genoa Sestri yard completed three of the ships – Esso Brega, Esso Portovenere and Esso Liguria. The fourth vessel, Laieta, was delivered by the Astano yard at El Ferrol in Spain in 1970. Esso Portovenere had a relatively short trading life, being broken up in Taiwan as Portovenere in 1986 due to lack of trading opportunities in what was a quiet early spell for the LNG industry. Esso Liguria became LNG Elba while Laieta, the first LNG carrier to be built in Spain, was scrapped in India in 2008.

The hull and containment system of Esso Brega and her three sisters reflected the cautious approach of the Esso designers, shipbuilders and class societies at a time when LNG transport was just commencing. The result was a quartet of the most robust LNG carriers ever built. The conservative approach undoubtedly contributed to the splendid lifespans of the pair of vessels scrapped this year, not to mention that of Laieta.

The ships were arranged with a main deck, trunk deck, aft superstructure, cruiser stern, aft peak, machinery spaces, Flume anti-rolling tank, four cargo holds, deep tank, bow thruster space, forepeak and bulbous bow. As was the practice at the time, longitudinal, riveted, crack-arresting seams were fitted at the sheer strake, the main deck at the trunk sides and at the top of the longitudinal bulkheads.

The four prismatic cargo tanks on each ship were constructed of aluminium alloy type 5083 and fitted in each hold space below the main and trunk decks. Transverse cofferdams were fitted between each cargo tank and at the aft and forward ends of the cargo tanks. A double bottom was fitted throughout the machinery space and cargo hold spaces while side and deck water ballast tanks were fitted throughout the cargo hold spaces. The ships were longitudinally framed.

The main De Laval propulsion machinery on the ships consisted of a superheated steam turbine plant that included one ahead turbine, one ahead turbine combined with an astern turbine and one reduction gear-type, locked train with first and second reduction stages. The two Foster Wheeler D-KNW main boilers manufactured by Ansaldo Meccanico Nucleare of Genoa in Italy formed an integral part of the propulsion system on each ship.

The four independent, prismatic shape, aluminium alloy cargo tanks on each ship were built by Chicago Bridge & Iron (CB&I). Each tank was provided with a full length trunk and was constructed with double walls of aluminium. The tank's inner plating comprised the LNG containment system's primary barrier while the outer tank boundary plating was the secondary barrier. The distance between the tank double walls varied between 150 and 250mm and the space was stiffened by T-shaped aluminium extrusions.

The internal structure of the tanks consisted of deep transverse webs and horizontal stringers. Not only were transverse swash bulkheads fitted but also a longitudinal centreline bulkhead, which was liquid-tight below the trunk. Supporting the robustness of the tank design were the large internal brackets fitted in line with the tank positioning keys at the mid-length of the sides of the tanks and at the tank ends at the centreline.

The keys holding the tanks in position were unique to the Esso design. Unlike the arrangements for the Conch and IHI SPB systems or that for the independent cargo tanks on conventional fully refrigerated LPG carriers, where top and bottom centreline keys are used to prevent transverse and longitudinal movement of the tanks, Esso preferred vertical positioning keys located at the centreline of the ship at the ends of the cargo tanks and at the mid-length of the sides. End and side positioning keys consisted of centre-key structures, stainless steel and Teflon-faced laminated oak blocks, and side support brackets.

The bottom supports of the cargo tanks were located in line with the double bottom floors and cargo tank transverse webs. A total of 26 supports, constructed with 9 per cent nickel steel webs and face plates, were fitted under each cargo tank. Teflon sheets and a stainless steel tray were positioned between the steel supports and the balsa blocks. The 22 anti- flotation blocks fitted on each cargo tank top were located in line with the deck inner webs and cargo tank transverse webs.

Each cargo tank was also fitted with 26 jacking pads located at their lower sloping sides. For close inspection of the bottom supports and inner bottom at centre, or if repairs were necessary, the tanks could be jacked up by removing the anti-flotation blocks. The fact that all four ships traded without any major incident begs the inevitable question: were the jacking points ever used? Each tank on the Esso Brega quartet was provided with two submerged J C Carter 500 m3/hour electric cargo pumps. Each cargo tank was provided with a circular vertical trunk to enable access to the bottom of the inner barrier space and the inner barrier pump.

The insulation for the Esso Brega containment system comprised a layer of polyurethane foam, plywood sheets and a second layer of polyurethane foam, aluminium sheathing and aluminium batten strips. The arrangement was mounted on the outer tank boundary and the plywood was secured to the cargo tank with studs and the aluminium batten strips fixed to the plywood with screws.

The cargo control room on the Esso Brega series was situated at the front of the accommodation superstructure, overlooking the main deck and cargo area. The main console carried a cargo monitoring system and a clear mimic diagram of the cargo and water ballast systems. All routine cargo and ballasting operations were conducted from the control room

The systems included pressure, temperature and level indicators, alarms and custody transfer. Throughout loading and discharge and during passages the temperatures of the cargo tanks and void spaces were monitored from thermocouples located at 128 cargo tank positions and at 288 hull positions. While professionals on board most LNG carriers can go through life without ever seeing the cargo they are handling, the thick sight glass on the access hatch of each cargo tank on the Esso Brega-class ships enabled the LNG to be seen and ullage readings to be taken from a fixed measuring scale located inside the top of the cargo tank. Each ship was provided with a cargo compressor room on the main deck starboard below the main cargo crossover pipes

The room contained two Airco Cryogenic centrifugal compressors driven by a coupled steam turbine, two cargo heaters, a control panel and associated equipment. Each ship was equipped with two Air Liquide 22,000-litre nitrogen tanks on the second deck forward. The nitrogen was used for purging and inerting the cargo tanks' inner barrier spaces, hold void spaces and cargo compressors. By 1996 Esso Brega and Esso Liguria had been renamed SNAM Palmaria and SNAM Elba. That year SNAM SpA's Marine Department contracted ABS Marine Services to carry out a longevity/life extension study for the two ships, and I was part of the ABS inspection team. Each longevity study included a review of the vessel's ABS and RINA classification records, a review of the performance history, a condition assessment survey, ultrasonic thickness gauging and a scantlings re-evaluation analysis. SNAM Elba was visited in November 1996 when in a gas-free condition alongside the San Giorgio del Porto repair yard in Genoa. All cargo tanks and hold void spaces were entered.

The clean and 'as-built' condition of the plating, webs, stringers and other stiffening inside the cargo tanks was particularly notable. Many of the original marks made on the internal structures by owner representatives, class surveyors and construction workers a quarter of a century earlier were plainly visible. Evidence of the multiple checking undertaken during construction was given by four sets of approving signatures from Esso, CB&I, ABS and RINA representatives at various points. There were other interesting marks. There were dates of construction in Roman numerals on a piece of steelwork as well as lengthy calculations of conversions from imperial to metric units scribbled on any convenient surface. I even noted on one transverse web in No 3 cargo tank the names of some girls and a local address before putting two and two together!

The advantages of using nitrogen in the hold void spaces was clearly evident as the inner bottom and inner hull plating, tank supports and keys and cargo tank insulation were found to be in good, dry condition. Further evidence of the cautious approach by the Esso design team was given by the heavy construction of the end and side keys for positioning the cargo tanks. Following the completion of refit work, I boarded SNAM Elba again on 24 January 1997 at Genoa Roads. During my time on board, the ship completed a ballast passage to the Algerian port of Skikda and loaded LNG for shipment to the Panigaglia LNG terminal near La Spezia in Italy.

I returned to Panigaglia in May 1997 to carry out a second condition assessment survey on SNAM Palmaria. On this occasion we sailed in ballast to load cargo at Arzew, also in Algeria. On the ship's previous voyage to the port three stowaways had boarded the LNG carrier, climbing up the anchor chain from a small boat during the night, as it lay waiting for the departure of another LNG carrier from the loading berth. When SNAM Palmaria arrived at Arzew on my voyage, the master, bearing in mind his recent experience, decided not to anchor but to keep his vessel under steam off the port until the loading berth was ready. Officers and crews of all LNG carriers loading at Algerian ports at that time were well aware of the difficult political situation in the country and of the potential risks involved. No one went ashore. Only the entrance to the cargo control room remained open.

All other doors to the accommodation, deck houses and store rooms were locked. When loading was underway the night I was on board, there was a quiet eeriness about the ship. Armed guards stood at the gangway while convoys of buses with military escorts were clearly visible onshore as they transferred refinery staff to their places of work. The bright waving lights and moving shadows from the refinery flares lit up the night sky, adding to the general feeling of unease.

The inspection of double bottom and cofferdam water ballast tanks was the first task on the return passage to La Spezia. Each tank had relatively small amounts of clean water ballast, sand and pebbles resting on the bottom shell and the spaces were found to be in good condition. My fellow inspector joked that he half expected to find footprints in the sand from unwelcome stowaways. I had the opportunity to inspect SNAM Palmaria's cargo containment system in November 1997 when the vessel was at the San Giorgio del Porto yard in a gas-free condition.

The overall condition of LNG Elba and LNG Palmaria in 1996 and 1997, after more than 25 years in service, was a credit to their designers, shipbuilders, owners, officers and crew. On my inspections I found the internal structures, primary barriers, tank supports, tank positioning keys, anti-flotation blocks, insulation and the hull structures in way of the void spaces to be in remarkably good condition.

The conservative Esso approach to LNG carrier design coupled with the experience of the European shipbuilders resulted in a robust hull structure and containment system structure. The use of sound gas-handling equipment with simple operating controls added to the efficacy of the overall package while quality control during the building stage was enhanced by the presence of numerous overseers, including dual ABS and RINA class surveyors. The subsequent operation of the vessels by two energy majors committed to high standards of crew training and ship maintenance was another key element in the long-term success of the Esso Brega series.

The ships were subject to only moderate bending, shear force and thermal stresses over their working lives due to the benign nature of the cross-Mediterranean trading routes, homogeneously loaded cargo and ballast conditions, the use of the Flume anti-rolling system and the careful monitoring of

temperatures in the cargo tanks and holds. Other favourable factors were propulsion machinery that was never required to operate anywhere near its design limits, ballast water that was only ever taken from the Mediterranean Sea, the use of nitrogen inerting in the hold void spaces, and regular berthing at dedicated terminals. Shipboard harmony is also an important safety consideration, and the impression I gained from my fleeting experiences of the vessels was that life on board was like home from home for the crews. Single-nationality officers and crew, the direct employment by the owners of long-serving personnel and first-rate Italian cuisine were key factors. Plaques of St Francis of Paola, the patron saint of sailors, on the superstructure fronts of the ships added to the sense of well-being.

On returning home those seafarers would have found, as I did, the sheltered waters of the Panigaglia terminal access channel and the cliff-top church in the nearby fishing village of Portovénre one of the most picturesque approaches to an LNG import facility. I recall with pleasure the bright sunny morning of 1 February 1997 when my own appreciation of these beautiful surroundings was enhanced by the satisfaction of having completed some strenuous ballast tank inspection work on board SNAM Elba. The ship berthed, discharged her LNG cargo and embarked on another 15 years of useful service life.

http://www.aukevisser.nl/inter-2/id689.htm
http://www.aukevisser.nl/inter-2/id1151.htm
http://www.aukevisser.nl/inter-2/id507.htm - esso_liguria__2__2
http://www.aukevisser.nl/inter-2/id422.htm
http://www.aukevisser.nl/inter-2/id1144.htm
http://www.aukevisser.nl/inter-2/id1239.htm
http://www.aukevisser.nl/inter-2/id677.htm

CON L' INSEGNA DEL FUMAIOLO RIMOSSA PRIMA DELLA PARTENZA PER IL CANTIERE DI DEMOLIZIONE

RINGRAZIAMENTI

Molte delle informazioni fornite provengono da coloro che hanno, negli anni gestito tecnicamente e commercialmente le navi.

In particolare, voglio ricordare i Comandanti ed i Direttori di Macchina che si sono avvicendati negli anni sulle navi. Elencarli tutti sarebbe difficile e inevitabilmente ne scorderei qualcuno. Alcuni di loro hanno poi seguito le navi dagli uffici di Milano, prima in Snam poi in ENI G&P e per finire in LNG Shipping.

Un ricordo ed un ringraziamento vanno all'amico, fraterno, Antonio Maresca e per le informazioni di carattere commerciale a Fabio Cassissa che ha seguito queste navi per tutta la loro vita con il simbolo del cane sulla ciminiera.