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Centrale Bond van Scheepsbouwmeesters in Nederland

Nederlands Scheepsbouwkundig Proefstation

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De toekomst van de Maritieme Techniek*

Een aangenaam facet van het beroep hoogleraar is, dat men met jonge mensen te doen heeft. Want jonge mensen zijn in het algemeen enthousiast en hebben de toekomst open voor zich liggen. Juist in deze sombere tijden met de industrie-hemel vol zwarte wolken is het verfrissend om met jonge mensen om te gaan.
Dat de hemel in de scheepsbouw, scheepvaart en offshore tegenwoordig somber is, is overal bekend en dit hoef ik u, toehoorders betrokken bij het maritiem gebeuren, niet meer te vertellen. Een schrale troost is echter, dat de internationale recessie alle geïndustrialiseerde maritieme landen met hoge lonen, inclusief Nederland, maar ook Japan, heeft getroffen.
Anderzijds zal de wereld-economie in alle tijden maritiem transport nodig hebben. De wereldbevolking verdubbelt iedere 75 jaar en met haar ook de transportbehoefte. Al mag de olieprijs met 5 of 10 dollar dalen, oliewinning uit de zeebodem, de offshore zal blijven bestaan en groeien, juist in die mate waarin de energiebehoefte van onze wereldbevolking toeneemt.
Daarom heeft de Maritieme Techniek, naar mijn inzicht, een grote toekomst. West-Europa is 'par excellence' de geschikte plaats waar gespecialiseerde schepen en maritieme constructies, die bijzondere 'know-how' eisen, ontwikkeld en gebouwd zullen worden. Kunt u zich, Nederland zonder maritieme aktiviteiten voorstellen? Ik tenminste niet!
De voorwaarde voor een goed maritiem beleid is, dat de 'know-how' in dit vakgebied consequent verder ontwikkeld wordt. Hoe slechter de tijden zijn, hoe intensiever de know-how ontwikkeld moet worden. En dat is de hoofdtaak voor onze afdeling der Maritieme Techniek, uniek in Nederland.
Maar nu kom ik op een punt waarover ik mij grote zorgen maak, en het zal niet eerlijk zijn als ik hierover zwijg. Zoals u wellicht weet moet er in het wetenschappelijk onderwijs drastisch bezuinigd worden. Daartoe heeft de Minister van Onderwijs en Wetenschappen een nota geschreven, getiteld 'Taakverdeling en Concentratie'.
Het bestaan van onze afdeling wordt ernstig bedreigd door de plannen die in dit verband bij het College van Bestuur van deze Hogeschool leven. Met name noem ik hun gedachten over samenvoeging van onze afdeling met de Afdeling der Werktuigbouwkunde.
Ik wil u erop wijzen dat een dergelijke samenvoeging met deze TVC-operatie nauwelijks iets te maken heeft. Wij hebben hier te maken met een additioneel beleid van het College van Bestuur. Het College verwacht organisatorische voordelen, maar heeft tevens erkend dat een fusie van de Afdeling der Maritieme Techniek met de Afdeling der Werktuigbouwkunde nauwelijks of geen besparingen zal opleveren.
Dat door een samenvoeging een herkenbaar gezicht van het onderwijs en onderzoek der Maritieme Techniek in binnen- en buitenland gedeeltelijk of totaal verloren gaat, wordt blijkbaar onvoldoende onderkend. Maar juist dat herkenbare gezicht is voor het 'know-how kweken' en voor de export-positie essentieel: dat herkenbare gezicht is noodzakelijk voor het aantrekken van jonge mensen. Daarnaast is het voor het buitenland van belang te weten dat hier een goede opleiding en goed onderzoek is, die in feite garanties kunnen geven voor een goed produkt.
Ook als het College van Bestuur aanduidt dat het resultaat van deze fusie Afdeling der Werktuigbouwkunde en Maritieme Techniek zal heten, blijft de vrees voor afbraak gerechtvaardigd. Want ik wil u er

* Rede ter opening van het zestiende Lustrum van het Scheepsbouwkundig Gezelschap William Froude, door Prof. dr. ing. C. Gallin, decaan van de afdeling der Maritieme Techniek bij de T.H. Delft op 2 maart 1983.

Inhoud van dit nummer:

De toekomst van de Maritieme Techniek

Orderportefeuille voor nieuwbouw teruggelopen

Large Oil Tanker Structural Survey Experience

Nieuwsberichten

op wijzen dat de TH volgens een parlementair stelsel wordt bestuurd. Dat betekent dat de meerderheid beslist. Een relatief kleine groep, zoals die der Maritieme Techniek maakt weinig kans zich binnen een grote afdeling der Werktuigbouwkunde en Maritieme Techniek in zaken zoals onderwijsprogramma of onderzoek succesvol te verdedigen. Daartegen helpen ook de mooiste toezeggingen niet. De 'insiders' van de universitaire wereld weten dit uit ervaring maar al te goed. Bovendien is de afdeling der Werktuigbouwkunde zelf aan een zware afslanking en takenruil onderworpen.
Dat in deze zware afslanking ook de Maritieme Techniek zal worden betrokken is niet denkbeeldig, hetgeen een verdere afbraak van dit vakgebied tot gevolg zal hebben.
Wanneer dit bij de aspirant-studenten bekend wordt, zal de jaarlijkse studenteninstroom afnemen. Aangezien de omvang van de afdeling op studenten-aantallen gebaseerd is, leidt deze afname verder tot minder onderwijs en onderzoek en zo gaat de spiraal langzaam maar zeker naar beneden.
Om een lang verhaal kort te maken: dit zijn de donkere wolken die zich boven onze hoofden samentrekken. Als decaan van de Afdeling der Maritieme Techniek hoop ik dat het gezonde verstand zal overwinnen. In de laatstgehouden vergadering van de Hogeschoolraad is daarvan al iets zichtbaar geworden. De Hogeschoolraad heeft namelijk besloten, dat men zich pas zal uitspreken over een fusie van afdelingen als men kennis heeft kunnen nemen van een advies van externe deskundigen. Want in een goed overleg tussen het College van Bestuur, het Afdelingsbestuur en het bedrijfsleven kan aan een slagvaardige afdeling der Maritieme Techniek gestalte worden gegeven. Bij zo'n belangrijk vakgebied mag er beslist geen water in de wijn worden gedaan.
Ik denk dat dit juist vandaag nog weer eens duidelijk zal worden. Ik vind het verheugend dat ons Scheepsbouwkundig Gezelschap William Froude, een 80 jaar oude vereniging, daaraan, door het organiseren van deze dag, ook een bijdrage wil verlenen. Daarmee heeft de vereniging William Froude haar bestaansrecht opnieuw nog weer eens duidelijk bewezen. Ik hoop van harte dat dit illustere gezelschap in het belang van de Maritieme Techniek en van de studenten haar activiteiten zal kunnen en willen voortzetten, zodat wij over 20 jaar in een zelfstandige en krachtige afdeling der Maritieme Techniek met u allen het honderd-jarig bestaan mogen vieren.

Orderportefeuille voor nieuwbouw teruggelopen

De lichte verbetering van de orderportefeuille van Nederlandse scheepswerven welke zich per 1 januari 1982 aftekende, is per 1 januari 1983 veranderd in een daling. Bedroeg de totale waarde van de in opdracht te bouwen schepen in 1982 nog ƒ 2.330 miljoen goed voor de bouw van 117 schepen met een totaal van 524.895 CGRT (compensated gross tons), per 1 januari 1983 is die totale waarde teruggelopen tot ƒ 2.100 miljoen, vertegenwoordigend een orderportefeuille van 109 schepen met een totaal van 467.860 CGRT. Vooral de opdrachten voor buitenlandse rekening zijn teruggelopen. In januari 1982 maakten nog 44 schepen met een totaal van 153.085 CGRT voor buitenlandse rekening deel uit van de gezamenlijke orderportefeuille, een jaar later zijn dit nog maar 29 schepen met een totaal van 87.030 CGRT.
Steeds vaker besluiten reders hun bouwopdrachten in eigen land onder te brengen mede door de overheidssteun welke ze daar kunnen verwachten. Daarnaast zijn er in de wereld, met name in het Verre Oosten, nog altijd scheepswerven die dermate door hun overheid worden gesteund dat zij met offertes op de markt kunnen komen die voor Europese begrippen nauwelijks de materiaalkosten dekken.
Na de sterke inzinking van de zeescheepsnieuwbouw in de tweede helft van de zeventiger jaren, was er in 1981 en in begin 1982 sprake van enig herstel.
Uit recente cijfers blijkt nu dat het herstel zich helaas niet voortzet.
Deze ontwikkeling en de nieuwe marktverwachtingen wijzen erop dat de opleving in de scheepsbouw nog wel enige tijd op zich zal laten wachten.
Wel is duidelijk dat de invoering van de z.g. generieke steun een gunstige uitwerking heeft op de voltooiing van het herstructureringsproces. Door het toekennen van die generieke steun, waarvoor in beginsel alle scheepswerven die zich op de nieuwbouw van zeeschepen toeleggen in aanmerking komen, wordt de ondernemingsprikkel niet ondergraven terwijl deze regeling ook geen concurrentie vervalsing in de hand werkt.
Het is niet aan te nemen dat de scheepsbouw in Nederland al met ingang van 1985 geheel op eigen benen zal kunnen staan. De in deze jaren teruglopende generieke steun en de voorgenomen beëindiging daarvan in 1985, geven veel problemen bij een nog voortdurend moeilijker wordende markt waarop concurrentie vervalsing en protectionistische maatregelen veelvuldig voorkomen.

CEBOSINE

Deze problemen worden nu door de Beleidscommissie Scheepsbouw nader onderzocht. Het kan haast niet anders of de conclusies van dit onderzoek zullen leiden tot een ook na 1985 voort te zetten overheidssteun aan de Nederlandse scheepsbouw.

Ontwikkeling orderportefeuille zeescheepsnieuwbouw

Datum	totale waarde in milj. gld.	waarvan voor buitenl. rekening	totaal CGRT *	waarvan v. buitenl. rek.	totaal aantal schepen	waarvan voor buitenl. rek.
1.1.1980	1.300	660	381.586	192.839	85	39
1.1.1981	1.550	750	420.804	208.570	94	39
1.1.1982	2.330	660	524.895	153.085	117	44
1.1.1983	2.100	370	467.860	87.030	109	29

* GGRT, compensated gross tons is een aanduiding waarin de moeilijkheidsgraad van de nieuwbouw verwerkt is in de tonnenmaat.

9 maart 1983.

Large Oil Tanker Structural Survey Experience*

SYNOPSIS

The following paper describes a major structural inspection program initiated by Exxon Corporation on its 46 owned VLCC/ULCC s in early 1981.

The organization and execution of the program represents a significant departure from earlier Exxon practice. The results highlight inadequacies in survey methods currently used by the industry and, in particular, those which are employed by most Classification Societies during Special Survey.

The circumstances which prompted this activity, as well as the technical findings on the vessels surveyed, are described.

Implementation of the survey program required a major commitment by technical staff, shore operating staff and ship crews to achieve a successful result. This organization is also discussed.

The major conclusion reached is that industry and Classification Society survey procedures need to be strengthened to ensure continued safe, pollution-free operation of the world's tanker fleet.

Introduction

Affiliated Exxon companies have conducted routine, steel inspections of VLCC's since their introduction into the Fleet in 1968. Concurrent with this maintenance activity, Exxon sponsored a research program of corrosion monitoring in the interest of predicting steel replacement requirements. The results of this latter work indicated that, although localized repairs might be necessary, major steel renewals were unlikely over a nominal 20 year life. Significantly, the research program determined, in 1980, that generalized thickness measurements could not be relied upon to determine precisely the location or amounts of repair which might be needed. Detailed visual inspection was necessary to identify areas of high corrosion, using ultrasonic thickness gauging to quantify losses.

In September 1980, a 250,000 dwt VLCC underwent Second Special Survey without a Class requirement for steel renewal. At that time the vessel was 10½ years old. Coincident with this survey, inspection of the structure by Exxon technical personnel alerted operating management to potential and unexpectedly high steel renewals of about 645 tonnes. These renewals were located primarily in segregated ballast tank stiffening and cargo/dirty ballast tank bottom plating and were based on replacement of steel which had corroded beyond a wastage allowance of 15%.

These findings were of concern not only due to earlier forecasts of much smaller steel renewals, but to the fact that bands of ultrasonic thickness measurements taken during the Second Special Survey did not detect this problem.

As a result of these findings, an intensive at-sea visual and ultrasonic thickness survey was undertaken on a sister-ship of comparable age in early 1981. This survey, which included over 10,000 ultrasonic readings, suggested potential steel replacement requirements on the order of 1,130 tonnes, again based on a 15% wastage allowance. In addition, extensive coating of structure was considered necessary to prevent additional structure corroding below minimum acceptable values. Following discussions with Class, it was agreed that rule changes since construction of these vessels would allow reduced scantlings under today's Rules. As a result, the vessel effectively had a built-in additional corrosion margin. Steel renewal estimates for the vessel were reduced to about 450 tonnes.

A detailed follow-up survey of the initial vessel confirmed steel renewal requirements of about 365 tonnes.

The magnitude of these repairs raised serious questions about the condition of the rest of the VLCC/ULCC fleet. Evidence was already available that VLCC/ULCC's were more susceptible to pollution problems than older, smaller ships due to corrosion and fatigue related material failures, e.g. pitting holes in bottom plating and fractures in side shell plating.

As a result, Exxon decided to survey all 46 owned VLCC/ULCC s to obtain a comprehensive assessment of their structural condition. Table I is a listing of the vessels.

TABLE I

EXXON OWNED VLCC/ULCC's

	NAME	YARD/HULL NO.	kDWT	DELIVERED
EUROPEAN-BUILT				
1.	Esso Scotia	A.G. Weser/1370	250	8/69
2.	Esso Europa	A.G. Weser/1371	250	12/69
3.	Esso Wilhelmshaven	A.G. Weser/1372	250	7/70
4.	Esso Cambria	Verolme/785	250	12/69
5.	Esso Nederland	Verolme/786	250	8/70
6.	Esso Europoort	Verolme/787	250	12/70
7.	Esso Copenhagen	Odense/30	250	4/70
8.	Esso Skandia	Odense/32	250	7/70
9.	Esso Northumbria	Swan Hunter/3	250	5/70
10.	Esso Hibernia	Swan Hunter/4	250	12/70
11.	Esso Ulidia	Harland & Wolff/1676	250	10/70
12.	Esso Caledonia	Harland & Wolff/1677	250	9/71
13.	Esso Bretagne	CDA, St. Nazaire/M24	250	12/71
14.	Esso Provence	CDA, St. Nazaire/U24	250	2/72
15.	Esso Italia	Italcantieri/4235	250	3/72
16.	Esso Flandre	Verolme/827	250	9/72
17.	Esso Bonaire	Verolme/828	250	2/73
18.	Esso Demetia	Kockums/539	255	5/73
19.	Esso Dalriada	Kockums/540	255	7/73
20.	Esso Gascogne	A.G. Weser/1385	250	12/72
21.	Esso Singapore	A.G. Weser/1386	255	5/73
22.	Esso Languedoc	A.G. Weser/1387	255	10/73
23.	Esso Bonn	A.G. Weser/1388	250	2/74
24.	Esso Saba	A.G. Weser/1378	250	5/74
25.	Esso Hamburg	A.G. Weser/1389	250	9/74
26.	Esso Normandie	CDA, St. Nazaire/R25	270	12/74
27.	Esso Africa	CDA, St. Nazaire/S25	270	4/75
28.	Esso Picardie	CDA, St. Nazaire/U25	270	1/76
JAPANESE-BUILT				
29.	Esso Okinawa	NKK/S18	255	9/73
30.	Esso Kagoshima	NKK/S19	255	11/73
31.	Esso Indonesia	NKK/S21	255	1/74
32.	Esso Osaka	Hitachi/4401	280	11/73
33.	Esso Honolulu	Hitachi/4402	280	6/74
34.	Esso Bilbao	Hitachi/4403	280	3/75
35.	Esso Hawaii	Hitachi/4404	280	10/75
36.	Esso Kawasaki	Kawasaki/1191	300	12/74
37.	Al-Duriyah	Kawasaki/1192	300	6/75
38.	Esso Madrid	NKK/S37	380	7/76
39.	Esso Le Havre	NKK/S38	380	1/77
40.	Esso Japan	Hitachi/4440	400	5/76
41.	Esso Tokyo	Hitachi/4441	400	10/76
42.	Esso Deutschland	Kawasaki/1233	415	10/76
43.	Esso Caribbean	IHI/2382	450	1/76
44.	Esso Mediterranean	IHI/2405	450	2/77
45.	Esso Atlantic	Hitachi/4484	510	8/77
46.	Esso Pacific	Hitachi/4485	510	12/77

The program began in early 1981 and by mid-April 1982, thirty-two vessels had been surveyed. Although the surveys are not complete, it is apparent that the structural condition of the fleet can be maintained to a safe, acceptable standard. However, as-built corrosion control systems are failing at vessel mid-life as expected and age related problems are becoming more significant. Improved maintenance and stricter monitoring of vessel structure than Classification Societies now provide will be needed in the future to ensure the continued structural integrity and pollution-free operation of these vessels.

* A Position Paper by EXXON CORPORATION

Conclusions

The main conclusions that have been drawn from the survey are:

- Current Classification Society methods of structural survey need to be modified recognizing recent and new experience with structural problems on large tankers and the difficulties of accessibility to the structure.
- Corrosion is the greatest problem facing the VLCC operator. Proper maintenance of corrosion control systems will be essential to ensure design life.
- Vessel age is the most significant factor affecting vessel condition. Older vessels will generally require a greater amount of repair due primarily to corrosion.
- Changes in Classification Society Rules for construction have resulted in reduced scantlings on younger vessel classes, and have thereby reduced the corrosion margin on these vessels relative tot earlier VLCC designs.
- Known areas of high operating stresses need to be monitored since corrosion effects can lead rapidly to structural failures in these areas.
- Design-related side shell cracking is occurring on older ships despite installation of remedial modifications. Although these cracks are not significant with regard to hull girder strength, they constitute a potential for minor pollution incidents. The modifications have reduced the length and rate of propagation of the cracks and appear to have significantly reduced the number of cracks penetrating into the side shell. Susceptible areas should be monitored and further investigation of more effective corrective action is warranted.
- Side shell cracking and other significant design-related cracking problems have generally been eliminated in later designs.
- Fatigue-related failure of structural details can be expected to occur especially as vessels age. These are primarily design-related but are aggravated by the effects of corrosion.
- Many factors can increase or decrease the actual service life of corrosion-protective coatings relative to design. Rapid structural deterioration can occur if early coating failure is not detected and if steel is not reprotected.
- Lack of corrosion control systems in cargo/dirty ballast tanks has led to heavy corrosion losses. Corrosion control systems must be installed in these tanks.
- Pitting in coal tar epoxy (CTE) coated horizontal surfaces and under bellmouths can be severe and rapid. Diligent monitoring is needed to prevent penetration of the hull.
- Accelerated corrosion loss, fracturing and buckling occur at flume openings and require monitoring.

Recommendations

Exxon believes that the structural condition of its VLCC/ULCC fleet can be maintained to safe, acceptable standards. However, this cannot be accomplished without a conscientious program to monitor the structure and corrosion control systems and to take prompt corrective action.

The vessels surveyed to date represent a meaningful sample of both early VLCC construction practice as well as later industry designs. Therefore, the problems identified within the Exxon fleet are probably typical of many industry vessels.

It is recommended that appropriate industry organizations, led by the Classification Societies, establish more rigorous standards and procedures for ongoing surveys of all tankers to detect conditions that could affect their structural integrity and pollution-free operation.

Adequacy of Industry survey practices

The circumstances which prompted the Exxon survey program highlighted two critical points:

- There was uncertaintly within Exxon on the reliability of data accumulated by traditional survey methods to give a realistic appraisal of the condition of a vessel.
- Classification Society Special Survey certification of structural integrity was found to be unrepresentative of actual hull condition in certain cases.

The decision to initiate a comprehensive inspection program reflected these concerns.

The resources necessary to conduct an adequate structural survey are significant and will require a major effort and commitment on the part of any tanker operator to independently organize. Consequently, Exxon believes that the industry needs to take a more active role in ensuring that adequate survey procedures are available, through the Classification Societies, and that they are rigorously applied in the interest of improving tanker safety and pollution-free operation.

Exxon practice prior to the current survey activity is considered typical of the industry. Therefore, while substantial changes in Classification Society inspection standards should, in our opinion, be defined and implemented, owners should continue to be especially aware of their own responsibilities in the care, surveying and repair of their ships.

The following discussion provides an overview of the Exxon program with the intent of prompting constructive discussion of how industry survey procedures can be improved.

The survey program

The major difficulty in adequately surveying VLCC/ULCC's is the physical size of the task. Table II illustrates the scope of work required to give complete coverage to a typical 250 kDWT vessel. The numbers are significantly larger for ULCC's. Historically, Exxon has inspected vessels during routine dry-dockings thus limiting survey to structure that was readily accessible. Special staging was rarely used due to its cost and the expense of extending the dry-dock periods.

TABLE II

VLCC STATISTICS

PER 250 KDWT VLCC	
• VERTICAL HEIGHT TO CLIMB FOR SURVEY	10,700 M/35,000 FT
• TANK SECTION AREA TO INSPECT	300,000 M²/74 ACRES - VLCC 720,000 M²/178 ACRES - ULCC
• TOTAL LENGTH WELDING	1200 KM/750 MILES (390 KM/240 MILES HAND WELD)
• TOTAL LENGTH LONGL. STIFFENERS	58 KM/36 MILES
• FLAT OF BOTTOM AREA	10,700 M²/2.6 ACRES
• 1.0 PERCENT PITTING (EA. 40 MM DIA)	85,000 PITS

Exxon concluded that the only practical method for obtaining complete inspection of the vessel is during ballast voyages. At that time, tanks can be progressively flooded to different heights and access to structure is provided by use of a raft. This method has limitations in that safety considerations do not permit placing inspectors in close proximity to the deck head. However, it has been used to successfully inspect significant areas of structure.

The most critical aspect of the at-sea survey, and the principal limitation on its success, is achieving adequate cleaning of tanks. Safe access for extended periods requires thorough removal of residual hydrocarbon for maintenance of a gas-free environment. Heavy accumulations of wax, sludge, sediment and scale have to be removed to expose bare steel for inspection and to ensure that structure can be climbed safely. The efficiency of this operation is dependent on the type and amount of tank cleaning equipment, its level of maintenance and on previous services of the vessel, e.g. length of voyage, time spent in floating storage and the type of crude oil carried.

Cleaning requires extensive planning and effort by management

and crew. In many cases, this may start several voyages prior to the survey with schedulers positioning the vessel to maximize cleaning opportunities and with the crew making preliminary inspection of tanks to ascertain where increased cleaning procedures are necessary. Several Exxon affiliates have provided additional manpower to remove sediment from critical survey areas.

The direct cost of a survey in 1981 was approximately $ 50K inclusive of charges for a steel inspector, ultrasonic team and analysis and reporting by a company naval architect. An additional cost is incurred for incremental fuel consumed in shifting ballast water during the survey as well as for cleaning the vessel to an adequate standard. Ballast shifts alone typically cost $ 8K. This level of expense emphasizes the need for thorough preparation by the vessel prior to embarking a survey team to minimize the necessity of re-inspection of inaccessible tanks.

A normal ballast voyage provides about 20 days to complete an inspection. This is a tight schedule and requires careful coordination between the survey team, ship's staff and shore management. A planning meeting is held with ship's staff after embarkation to review safety procedures associated with tank entry, acquaint the crew with the procedures used by the team, and plan the sequence of full inspection. Emphasis is placed on conformance with approved Company and industry safety standards. The survey team is required to reject any tank for inspection that does not meet these standards.

An inspection sequence is selected which minimizes ballast shifts to conserve time and fuel. The first tank structure inspected is normally the bottom plating and adjoining structure in the tanks that the chief officer requires to be immediately available for minimal ballast movement. These tanks are then ballasted and bottom structure in remaining tanks is inspected. The team then returns to the partially ballasted tanks to complete the inspection of the upper portion of the tanks. Inflatable rubber rafts are used to move about the tank although a rigid boat which can be split for access through a tank hatch and reassembled in the tank is undergoing operational evaluation. Within each bay, free climbing of the structure is employed to improve the speed and efficiency of the inspection. The remaining tanks are completed in a similar manner.

The inspector checks the structure for corrosion wastage, buckling and cracking. Crack detection is done visually as suitable crack detection equipment is not available. The side shell attachments, bottom fore and aft girder bracket attachments, and stringer platform to bulkhead attachments are among locations examined where experience has indicated a high probability of local failure. While the inspector is making his visual inspection, the ultrasonic technicians take readings at predetermined locations in the tanks. These locations are decided ship by ship prior to the survey to give representative readings of the structure and coverage of known suspect areas. Additional ultrasonic readings are taken as found to be necessary by the inspector during the visual inspection of the tank. On average, about 8,000 readings are taken, although in excess of 11,000 readings have been taken in cases of severe corrosion.

Due to the large areas to be covered, the inspector has to focus on historically suspect areas to optimize the effectiveness of the survey. In-house training, based on past experience with these ships, is necessary to ensure satisfactory results from the inspector.

Complete coverage of the structure has generally not been achieved. However, on adequately cleaned vessels 85-90% of the tank section has been inspected. The most difficult area to inspect is the deckhead due to a lack of access other than by elaborate staging methods. Rafting is not used for the deckhead since the survey team would have to be temporarily trapped between deep transverse web frames as the water level was raised and lowered to inspect each bay. As a result, the deckhead is inspected visually from the highest practical water level, or upper walkways (if fitted) and ultrasonic readings are taken from the main deck of the plating and of any deck longitudinals available through deck openings.

Although tank cleanliness has been the major factor limiting the effectiveness of the surveys, other factors have been pertinent. Heavy seas causing roll of 5° or more prohibit safe tank work. High temperatures and humidity encountered in places such as the Red Sea and the Arabian Gulf can result in extremely difficult work conditions. For instance, a tank ambient temperature of 35°C with 95% relative humidity restricts effective working time to as little as 15 minutes per hour. Higher tank temperatures and humidity can easily occur and very little can be done to reduce them.

Upon completion of the survey all data is returned to the office for analysis and report preparation. The survey report includes estimates of necessary steel renewals, coatings and anodes. The nature and extent of any structural defects are detailed and repairs, modifications or changes in operating procedure are specified.

Estimates of steel renewals are based on the general wastage limits shown in Table III. These limits were developed based on discussions with the Societies classing the majority of Exxon vessels. They consider original design scantlings, in conjunction with current rule requirements, in the context of hull girder strength. Local buckling strength is also considered for specific cases.

Coating and anode recommendations are developed to protect remaining steel so that major steel renewals will not be needed during the remainder of the vessel's life. Average corrosion rates developed from historical data are used to determine the type and extent of corrosion control. Table IV shows typical values for segregated ballast tanks.

RESULTS

The principal findings of the surveys can be grouped into the

TABLE III

GENERAL WASTAGE LIMITS(1)

STRUCTURE	CLASSIFICATION SOCIETY "A"(2)	"B"(3)
Section Modulus	15% below current rule minimum	18% below current required rule area(4)
Individual deck, bottom, side shell, and longitudinal bulkhead plates:		
– deck or bottom plate	.85R	.75D
– within 10% of deck or bottom	.85R	.80R(5)
– elsewhere	.75D	.80R(5)
Longitudinals	.75D	.75D
Transverse Bulkhead:		
– Plates	.70D	.80R(5)
– Stiffeners	.70D	.75D
Stringers, web frames, vertical girders, cross ties	.85D	.80D(5)

R = current rule minimum thickness; D = design thickness(6)

Notes

(1) Fractures, permanent deformation due to thinning, and loss of watertight integrity in tank boundary plating must be repaired, including areas outside midship 0.4L. Alternatives to renewal include adding stiffening to bulkheads, frames, or girders, and adding longitudinal doublers to deck or bottom to increase section modulus. These general wastage limits may be superseded by strength considerations.

(2) Classification Society "A" allowances are for midship 0.4L only. Classification Society "A" does not normally gauge other areas until 4th Special Survey.

(3) Classification Society "B" allowances are for the entire ship's length.

(4) Required area is the area necessary to obtain section modulus. An 18% reduction in deck and bottom area corresponds to a 15% reduction in section modulus.

(5) Structures may waste to at least 3mm below design.

(6) Design thickness is the as-built thickness less any owner's extra.

TABLE IV

AVERAGE GENERAL CORROSION RATES FOR STEEL STRUCTURE IN SEGREGATED BALLAST TANKS

Service	Exposure	Bare Steel Annual Loss Rates - Millimeters	Cathodically Protected Steel Annual Loss Rates Millimeters
Ullage Space	1 Side	0.20	Not applicable
Ullage Space	2 Sides	0.30	Not applicable
Splash Zone	1 Side	0.5 - 0.7	Not applicable
Splash Zone	2 Sides	0.7 - 1.0	Not applicable
Immersed Zone	1 Side	0.5 - 0.7	0.14 - 0.20
Immersed Zone	2 Sides	0.7 - 1.0	0.2 - 0.3

[1] These corrosion rates do not reflect penetration due to pitting. Pitting running into grooves can lead to fractures requiring renewals.

[2] Cathodic protection is assumed to be 70% protective. Corrosion rates, therefore, are about 30% of that for unprotected steel.

[3] The rates assume that the tanks are ballasted for 50% of the time. However, some tanks may have greater ballast residence time as, for example, when compensating ballast for fuel burn-off is carried.

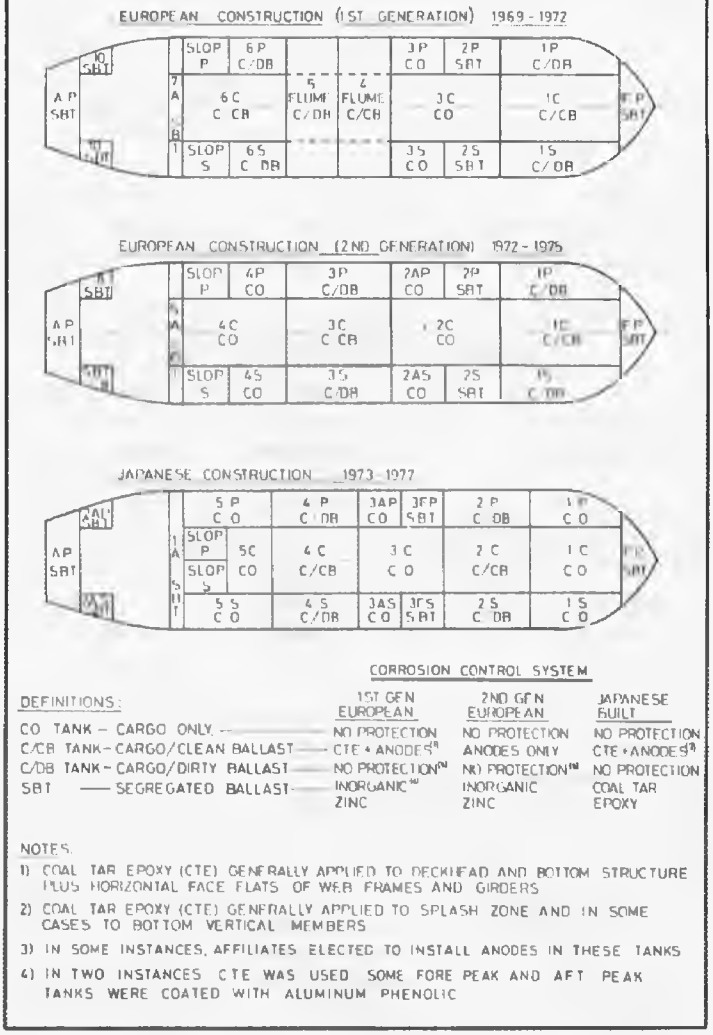


Fig. 1. Exxon tank designation scheme/initional corrosion control for typical vessels.

following five categories which are subsequently discussed in detail.

- Steel Wastage Patterns
- Side Shell Cracking
- Buckling and Fractures
- Corrosion Control Sytems
- Pitting and Grooving

Figure 1 has been developed as an aid to the discussions that follow. The figure shows typical tank services and corrosion control systems found on Exxon vessels. Exxon's early VLCC's were built in Europe between 1969 and 1975. These can be classed as two generations, the first covering the period 1969-1972 and the second 1972-1975. Later VLCC's and all ULCC's were built in Japan between iate 1973 and 1977. When distinguishing between European and Japanese-built vessels, the intent is to signify design differences due to different time periods rather than design differences between European and Japanese Shipyards.

Steel Wastage Patterns

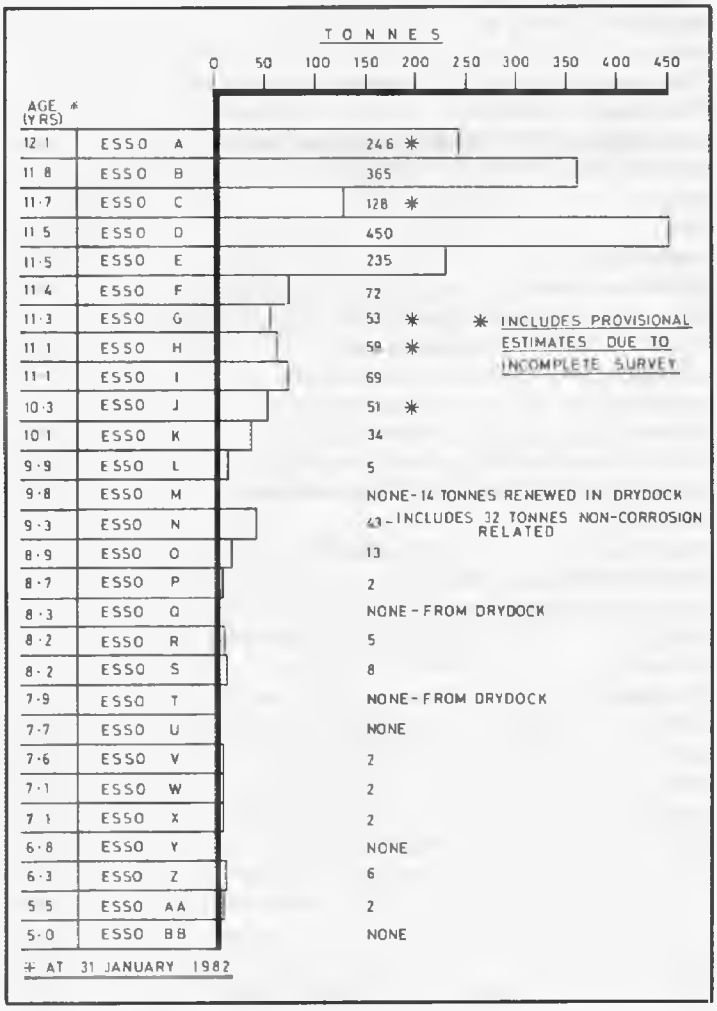
All of the ships are experiencing some degree of steel wastage. Figure No. 2 shows steel renewal requirements for the vessels in order of age. Steel renewals for a 250,000 dwt vessel average about 100 tonnes per ship with a high of 450 tonnes compared with a total steel weight of about 33,500 tonnes. There is a strong correlation of steel renewals with age.

The bulk of the wastage is occurring on internal tank structure subject to two-sided corrosion attack, and to horizontal surfaces such as stringer platforms, horizontal stiffener webs and bottom plating, particularly in unprotected cargo/dirty ballast tanks. Generally main deck, side shell and bulkhead plating have much lower corrosion rates.

In the segregated ballast tanks wastage is most severe in the splash zone where breakdown of the coating first occurs. In advanced cases of coating failure, wastage can also be heavy on structure in the immersed zone. This is the case on one vessel, where 215 tonnes of steel are required for renewal of a large portion of the transverse web frames and longitudinal stiffening in the upper half of the No. 2P/S segregated ballast tanks.

On older vessels with Flume tanks, wastage is heavy on stiffening

Fig. 2. Steel renewals required based on survey analysis.



in way of the flume openings and on side shell stiffening opposite the flume openings. No. 4 flume Tank is generally in cargo/clean ballast service and No. 5 Flume Tank is in cargo/dirty ballast service. The condition of the openings is similar, although there is generally greater anode protection for the cargo/clean ballast tank. The flow of the ballast through the openings is believed to contribute to a higher corrosion rate and reduces the effectiveness of anodes in way of the openings.

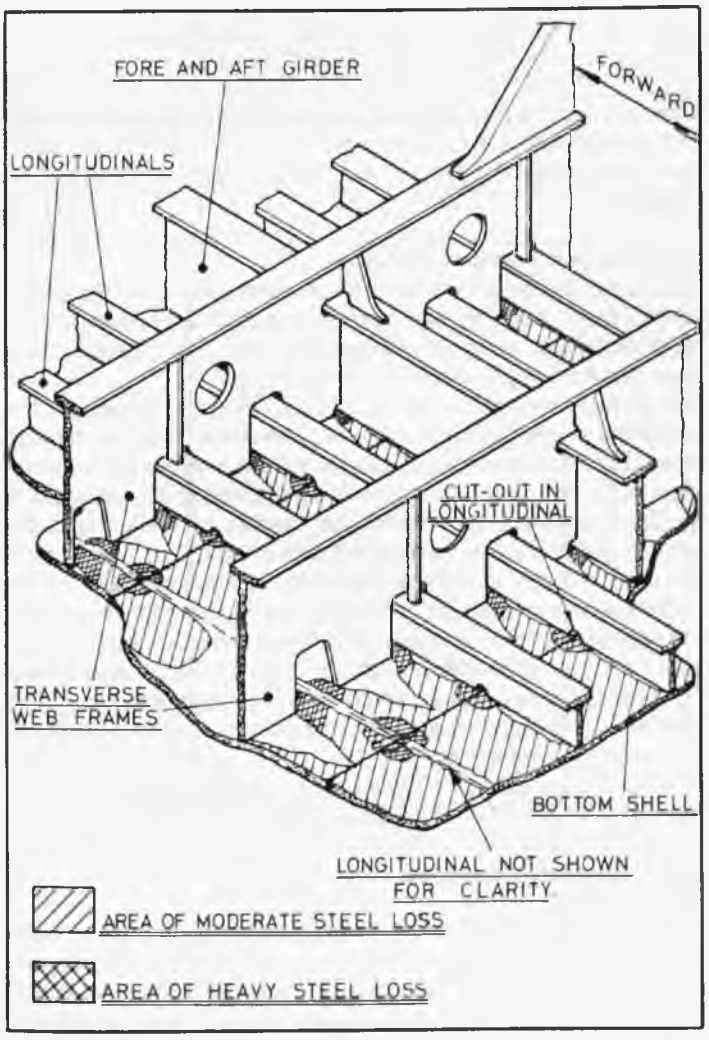
Heavy wastage has also been found on horizontal surfaces in cargo/clean and cargo/dirty tanks where tank washing machines are helping to remove protective wax/oil films. Crude oil washing (COW), by enhancing the cleanliness of the cargo tanks, apparently contributes to these higher wastage rates.

On bottom plating, corrosion patterns are evident in areas of high flow rates as shown in Figure 3. The flow of cargo and ballast through cutouts appears to be removing protective wax/oil films allowing accelerated corrosion to occur.

Finally, corrosion is occurring in the aft two bays of cargo only tanks, apparently due to water bottoms in crude and/or water wedges from condensation.

One area of concern is corrosion of bottom plating on Exxon's Japanese-built vessels. These ships are generally newer than the European-built classes and were constructed to different classification society rules. The rule changes resulted in thinner plating than comparably sized European-built vessels. The European-built vessels have generally thicker bottoms (about 28,5 mm) than would have been required if they were built today (about 23 mm). As a result, they can lose about 30% of their design thickness before renewals are required. Ships built to present day rules would only be allowed about 15% corrosion loss. Some European-built vessels will require extensive bottom plate renewals having

Fig. 3. Typical bottom shell loss patterns.



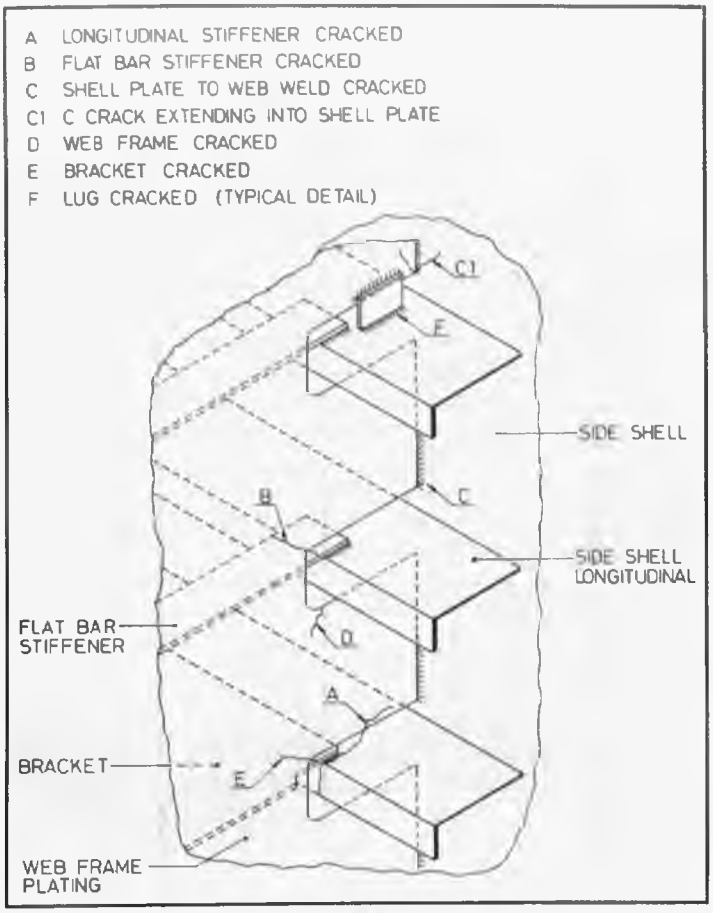


Fig. 4. Typical side shell structural defeats

lost in excess of 8 to 9mm in about 10 years. The same corrosion processes are occurring on the Japanese-built vessels where the margins are much smaller (about 4 to 5 mm). Preliminary indications from the Japanese-built vessels that have been surveyed so far indicate that extensive bottom coatings, primarily of cargo/dirty ballast tanks, but also of the aft two bays of cargo/clean and cargo only tanks, will be necessary to avoid excessive and early steel renewals.

Side Shell Cracking Problem

Many of our European-built VLCC's suffered from design related fatigue cracking in the side shell/web frame/longitudinal attachments. These cracks are of seven identifiable types as shown in Figure 4.

Type A is a fracture of the side shell longitudinal at the connection to the web frame bracket or stiffener. Type B is a crack in the web frame flat bar stiffener at the connection to the side shell longitudinal. Type C is a crack in the weld of the web frame to the side shell at the web frame cutout. Type C1 is a type C crack that has extended beyond the weld into the side shell plating. It is often V shaped, propagating on both sides of the web. Type D is a crack in the web frame plating usually at the inboard corners of the cutouts. Type E is a crack in the bracket connecting the web frame to the longitudinal. It is similar to type B. Type F is a crack in the weld of the lug connection to the longitudinal. Type C1 is of most concern due to the possibility of pollution through a crack in the side shell.

The cracks were originally detected in 1973. In 1975, a study highlighted the cracking as fatigue related. In 1976, recommendations for modifications were issued for all affected classes. The modifications consisted of fitting lugs and brackets at the side shell connections to reduce stress concentrations in the structure.

The 1975 study indicated that the cracking problem would become more extensive as the age of the vessels increased. The fore and aft extent of the corrective modifications was to be based on

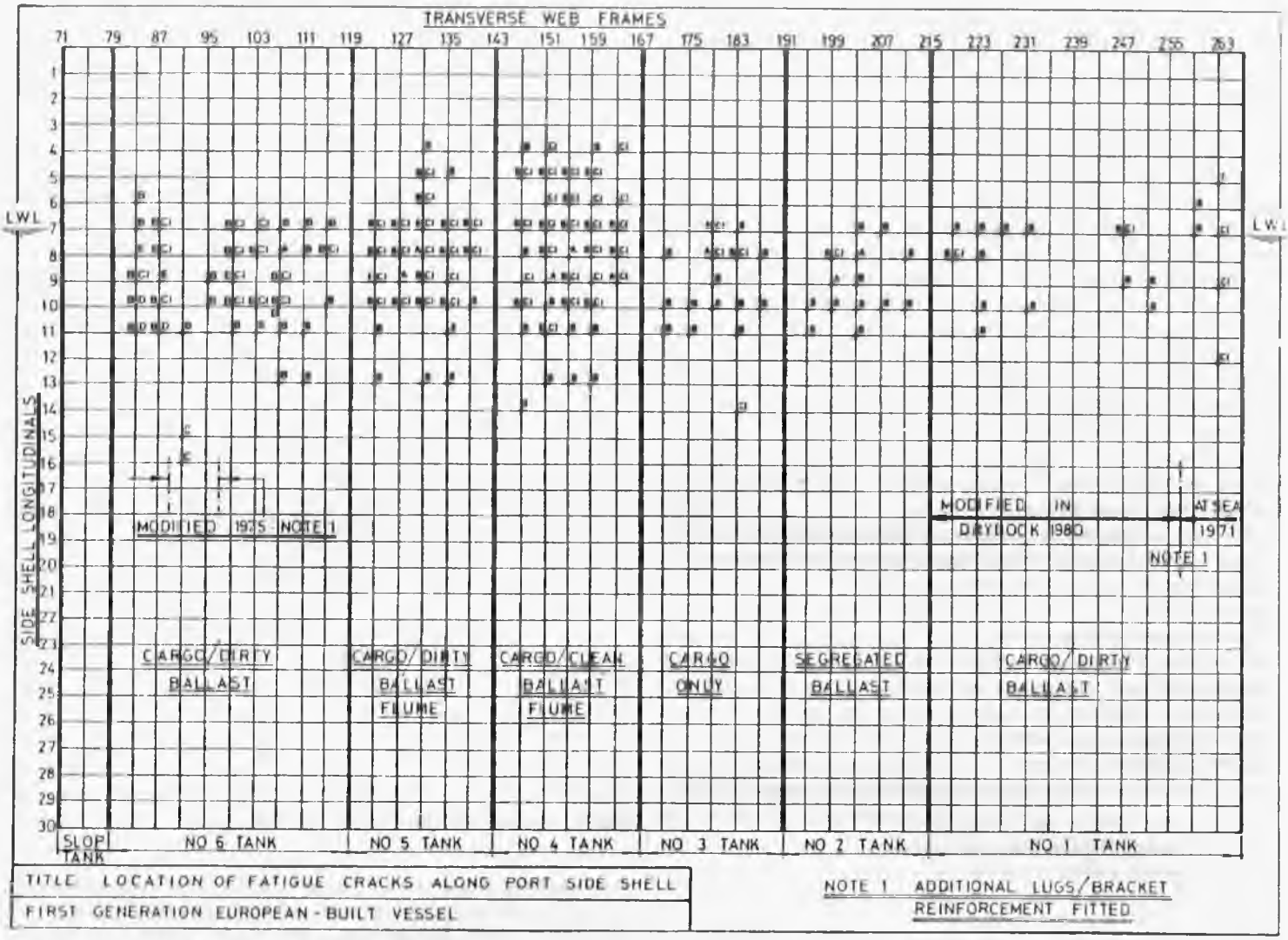


Fig. 5

monitoring by the operator, with increased incidence of side shell failure indicating the need for additional modifications. Most vessels had modifications made to tanks No. 1 P/S. Only a few vessels had every wing tank modified.

Recent surveys confirm that the side shell cracking is occurring along the entire cargo tank length. As a result, in September 1981 it was recommended that Exxon affiliates extend the modification to the full length of the cargo tank section, even though fatigue cracking might not yet be evident in the after wing tanks.

Figure 5 graphically illustrates the extent and type of side shell cracking typical of these vessels. This diagram is of the port side shell of one of the first-generation, European-built vessels. The horizontal lines represent side shell longitudinals and the vertical lines the transverse frames. The codes at the intersection of frames and longitudinals identify the type of crack found on the vessel (see Figure 4 for detail).

The cracking is generally concentrated at and just below the load waterline, in this case between longitudinals 7 and 10. A heavier incidence of cracking is usually found on the port side. This has been attributed to trading patterns that result in the port side being 'to the weather' a greater portion of the time.

Cracking is still occurring. However, in locations where additional lugs/brackets have been retrofitted, the incidence of cracking has been reduced as can be seen in tank No. 1 in Figure 5. Cracking is also less frequent in segregated ballast tanks and cargo only tanks where corrosion effects at high stress points are not as severe. Cracking in the No. 2 P/S segregated ballast tanks has only appeared in recent years as the inorganic zinc coatings in these tanks have started to fail.

This type of cracking is not occurring on later designs where knowledge of this problem has been reflected in the design details of the attachments. A comparison of typical first generation European design with a typical Japanese design is illustrated in Figure 6.

Buckling and Fracture Patterns

Because of the large number of inspections made over the years, characteristic buckling and fracture patterns are known for the older classes of ships. All are design related and appear to have been satisfactorily eliminated in later designs.

One of the more serious problems is fracturing and buckling of the centerline swash bulkhead and side girders in No. 7 Center tank on one class of first-generation vessels. Figure 7 shows the arrangement of the side girder. Characteristic fracturing and buckling of the tie beam is shown. It is often accompanied by fracturing of the vertical girder web on the forward side of bulkhead 71 and fracturing of the brackets on the aft side of the bulkhead. Buckling of the centerline swash bulkhead of this tank is also common. This area of the vessel sustains relatively high shear stresses, operating at about 90% of allowable maximum in both full load and ballast conditions. On one vessel which sustained significant corrosion loss as well as fracturing at the side girder connections, buckling of the bulkhead was noted.

Another typical defect is fracturing and buckling of the bottom centerline girder in another class of first-generation, European-built vessels as shown in Figure 8. This defect has been found in most center tanks throughout the ship.

Figure 9 shows typical bottom longitudinal cracking that has been found on some vessels of a class of second-generation, European-built vessels. These fractures occur in the bottom longitudinals and bottom shell at the erection butt welds of No. 3 tanks, amidships.

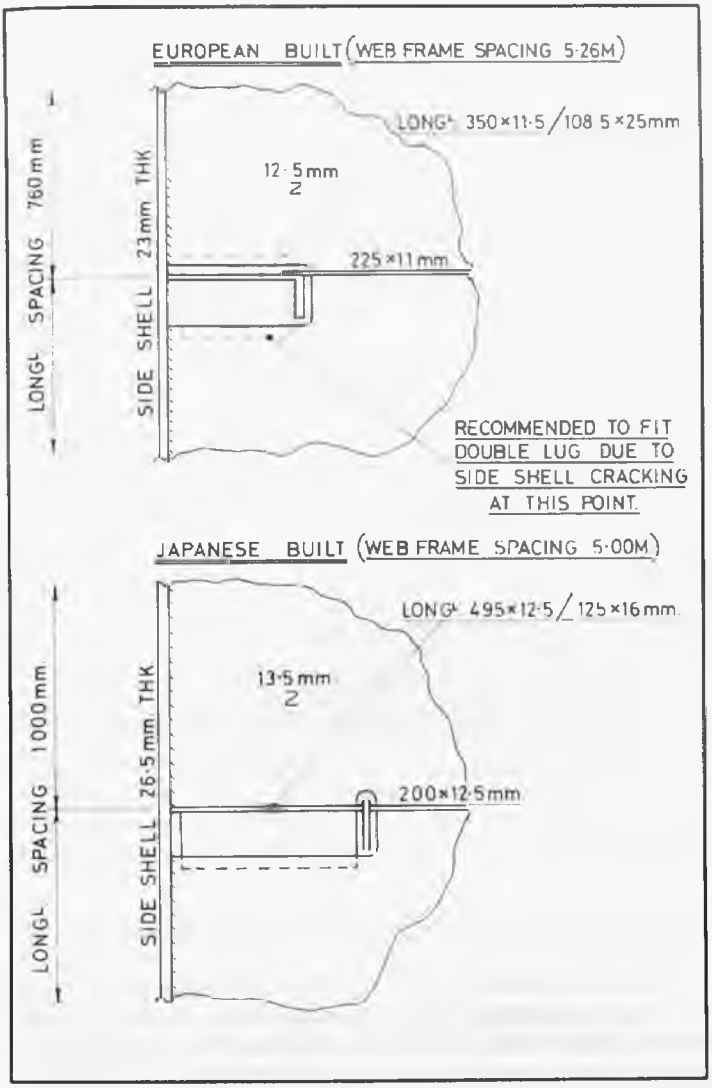


Fig. 6. Side Shell comparison detail at load waterline

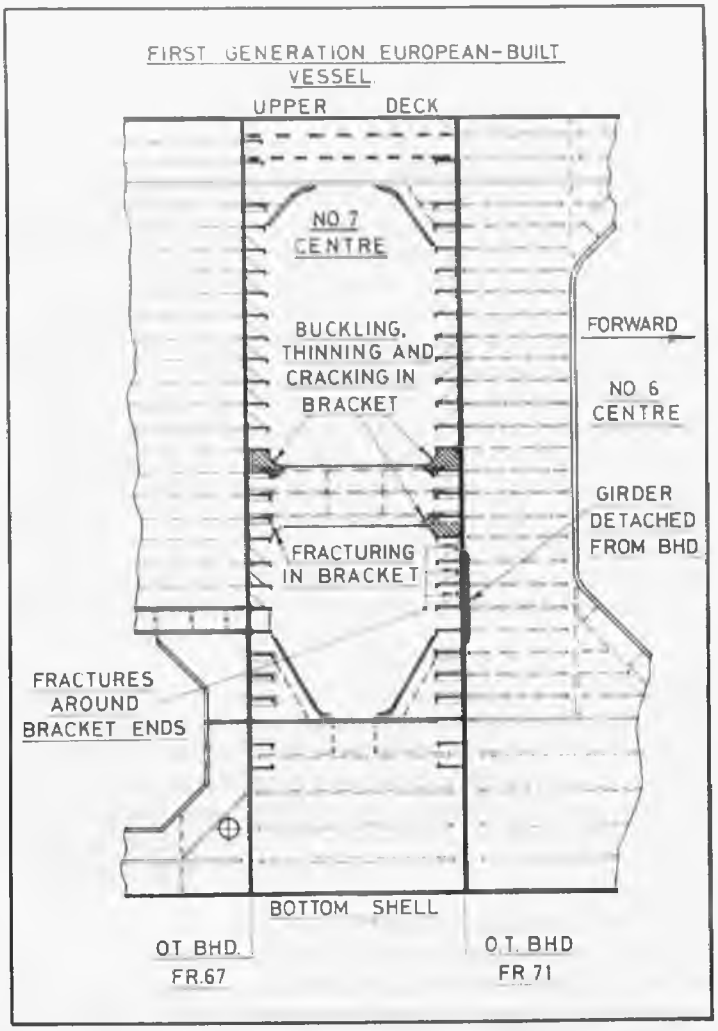


Fig. 7. Side girder 5200 from ℄ port and starboard.

Fig. 8. Centre girder cracking second generation European-built vessel.

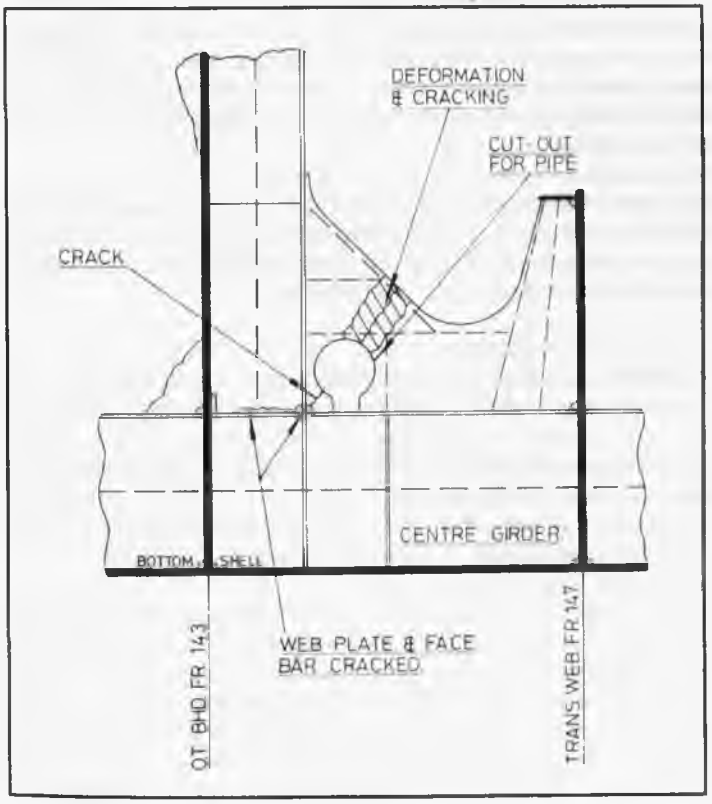
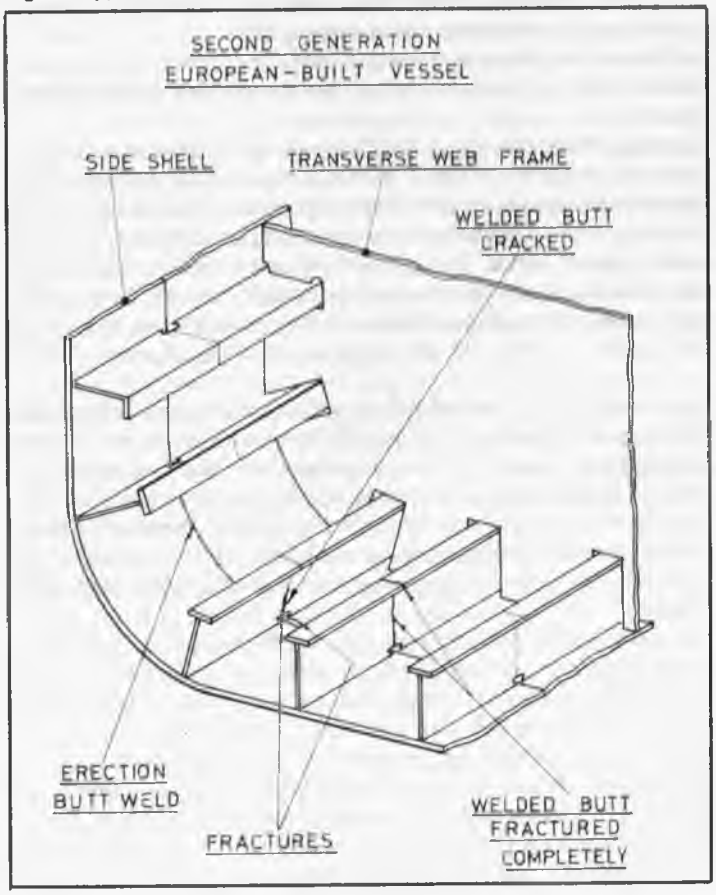


Fig. 9. Typical bottom longitudinal cracking



The erection joint for the longitudinals and bottom shell are in-line. A scallop is fitted in way of the bottom shell weld to facilitate production of a continuous erection weld. Cracks are initiating at the scallop.

Corrosion Control Systems

One of the major factors influencing the structural condition of a tanker is the effectiveness of the corrosion control system. Common methods of internal corrosion control are coatings, cathodic protection using sacrificial anodes, or a combination of both.

During the nominal 20 year life of a vessel, both methods wil require renewal since the effective life of some coatings may only be about 7 to 8 years and an anode system may only last 4 years. Renewal costs are expensive, but maintenance of the corrosion control system is extremely important to the structural integrity and pollution-free operation of the vessel. Early signs of coating degradation cannot be ignored. If appropriate action is not taken to restore or maintain the corrosion control system, corrosion wastage will be rapid and major costs will be incurred.

Since the corrosion control systems used on our European and Japanese-built vessels are different, they will be discussed separately.

European-Built Vessels

On the European-built VLCC's, the segregated ballast tanks i.e. the Fore Peak, Tanks No. 2 P/S, Tanks No. 7 Across, the Aft Ballast Tanks and the Aft Peak Tank, were generally protected by full inorganic zinc (IZ) coatings. An exception was made on two vessels which had full coal tar epoxy (CTE) coatings in these tanks. In some cases the Fore Peak and/or Aft Peak were coated with aluminium phenolic.

On the first generation vessels the cargo/clean ballast tanks, i.e. No. 1 Center, No. 4 Flume and No. 6 Center, had the deckhead and bottom structure coated with coal tar epoxy. Anodes were installed in the bottom of these tanks and were subsequently extended to the design ballast innage within a few years of construction upon development of save anode attachments that removed height restrictions on the anodes. The slop tanks were fully coated with CTE. The cargo/dirty ballast and cargo only tanks were not protected due to anticipated low corrosion rates.

On the second generation vessels the CTE coatings in the cargo-/clean ballast tanks were omitted. Anode systems were installed instead.

Generally, the survey has found that segregated ballast tanks have been well protected by the IZ coatings. However, once the coating begins to fail, total failure and ensuring corrosion can be rapid. The nominal life of an IZ coating is 7 to 8 years under normal service with a 50% ballast factor. This depends on many factors associated with the application and service of the coating. Figure 10 charts the service life of IZ coatings of the No. 2 Wing ballast tanks of some of the vessels. Coating life has ranged from 5 tot 11 years.

In cases of early IZ coating failure where no corrective action was taken, steel renewals of 200 to 300 tonnes are needed. Where anodes have been retrofitted to protect the steel, renewals are reduced, but are still needed in the splash zone where anodes are not effective and the heaviest corrosion occurs. Wastage is heaviest on the webs of longitudinals and on the web frame horizontal stiffeners. In advanced cases corrosion also affects the web frame plating.

The cargo/clean ballast tanks have suffered overall corrosion losses consistent with the anode protection given to the uncoated steel in the mid-height region. The exception is in vessels with flume tanks where the washing action of the cargo/ballast has helped to accelerate the corrosion of the flume openings and surrounding structure. Again corrosion losses are heaviest on horizontal surfaces, primarily webs of longitudinal stiffeners, at about the splash zone level, normally about mid-height of the tank. These tanks are also suffering from heavy pitting of the bottom and

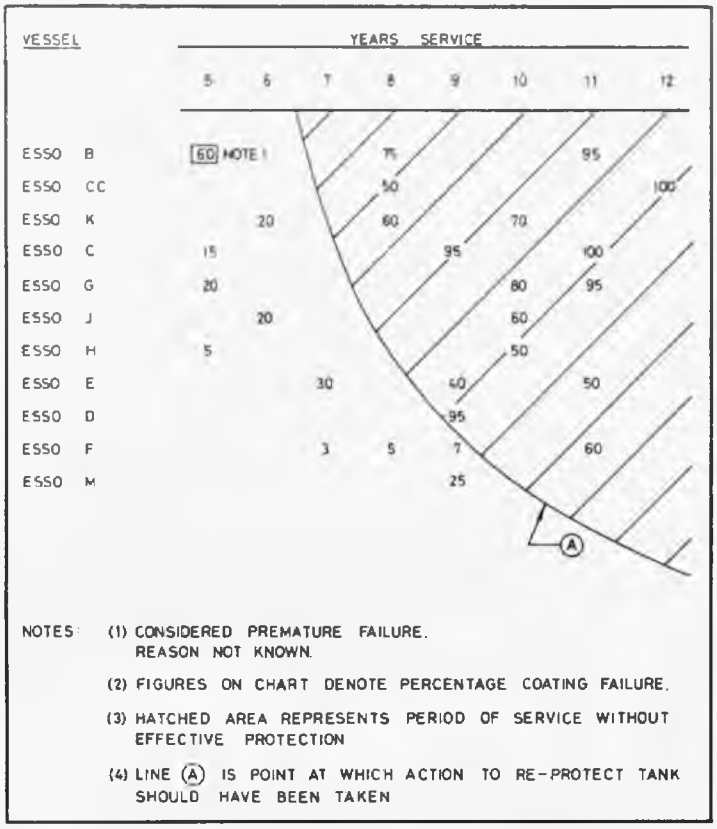


Fig. 10. Segregated ballast tank inorganic ZINC coating failure.

other horizontal surfaces on the first generation vessels with CTE coating.

The cargo/dirty ballast tanks, i.e. No. 1 P/S, No. 5 Flume, and No. 6 P/S, have experienced severe wastage where adequate steps have not been taken to protect these tanks. After a few years of operation it became obvious that severe corrosion could occur in these tanks. The corrosion is due to a breakdown or removal of the thick wax/oil film generally found on the structure of these tanks after discharge. Improved tank cleaning, including the development of crude oil washing (COW), and increased ballast residence times also appear to have contributed to increased corrosion rates. Some operators retrofitted anodes while others did not. The result is a wide variation in steel renewal requirements. Wastage was again found to be heavy on longitudinal stiffening at about the ballast innage, on structure in way of flume openings, and also on bottom plating.

In the cargo only tanks, i.e. No. 3 P/S and No. 3 Center, corrosion rates have been found to be generally low. The only area of notable loss is in bottom plating in the aft two bays of these tanks. Corrosion is apparently occurring due to water bottoms in crude and/or condensation collecting on the bottom.

Japanese-Built Vessels

A different corrosion control philosophy has been adopted on our Japanese-built vessels. Coal tar epoxy has replaced inorganic zinc as the coating in the segregated ballast tanks. In the cargo/clean ballast tanks, the trend has been to coat the splash zone and bottom vertical members and to omit CTE coating of the bottom. Full anode systems are fitted to the ballast innage. As on the European-built vessels, no corrosion protection is provided in the cargo/dirty and cargo only tanks.

Survey data from the Japanese-built vessels indicates that the segregated ballast tank coatings are holding up well after about 7 years service. In the cargo/clean ballast tanks wastage of the bottom plating is occurring but is sufficiently controlled by the anodes except in the aft two bays. Some CTE coating may be needed to prevent steel renewals in the future.

In the cargo/dirty ballast tanks corrosion is occurring at rates that

will require renewals primarily to bottom plating and stringer platforms. For this reason, CTE coating of the bottom and stringer platforms plus an anode system to the ballast innage is recommended.
In cargo only tanks corrosion of the aft two bays is occurring and will require attention.

Pitting and Grooving
Pitting and grooving in CTE coated tanks is a common problem throughout the fleet and the industry. Repair of pitting is tedious but is of great importance in preventing penetration of the bottom and subsequent pollution.
Once there is a breakdown in the CTE coating, pit penetration can be extremely rapid due to both galvanic and acidic attack. Galvanic attack occurs due to the small anodic area of the pit and the large cathodic area of the intact coating. Acidic attack is believed to occur due to the collection of acidic (sulphuric) water droplets in the pits.
Grooving is a continuous line of corrosion and is often found along weld seams. Touch-up coating of welds tends to fail faster than the rest of the coating. Pits start to form along the seams and eventually join up to form grooves.
If the pitting and grooving is not too deep, i.e. less than 1/3 plate thickness, recoating is recommended after proper cleaning and surface preparation. Once the depth of penetration exceeds 1/3 plate thickness, weld-up is necessary. In extreme cases of more than 2/3 penetration, replacement of steel is recommended.
The number of pits in a tank can be large. An estimate of 1% pitting, 50 mm in diameter in No. 6 Center tank for instance, would translate to about 7,000 pits requiring some form of repair. In many cases, the visual estimates of pitting have been higher.
The plating under bellmouths is vulnerable to pitting in both coated and uncoated tanks due to the added effects of high fluid velocities during discharge. Frequent inspection is required under bellmouths since several cases of penetration of bottom plating have occurred.

Further Work
At the time this summary paper was prepared 32 of 46 Exxon VLCC's and ULCC's had been surveyed. The remaining 14 vessels are, predominantly, the latest additions to the fleet.
The results of the completed surveys have enabled Exxon affiliates to accurately plan for steel replacement, hull repairs, renewal of corrosion-protection systems and, in many cases, augmentation of existing corrosion-protection systems to minimize maintenance problems for the remaining life of the vessels. Continuation of the surveys is considered necessary in order to monitor condition of the structure and to enable operators to prepare timely and effective repair specifications.
The general results arising from the remaining surveys, particularly as they relate to vessels built to the newest Rules, are expected to be made available in an update to this paper.

NOR-SHIPPING '83

Oslo 6-11 June 1983
Ship's equipment will be in particular focus at the ninth international Nor-Shipping exhibition being staged in Oslo, Norway, from 6th-11th June this year. Several of the interesting product developments due to be presented at the show involve the application of advanced technology to achieve improved overall operating economy, the organizer reports.
Key areas featured at the show will include safety equipment, automation, electronics and propulsion machinery. Other exhibits cover deck machinery, loading and discharging equipment, furnishing and fittings, shipbuilding, engineering, international maritime journals and so forth. The emphasis on equipment can be seen in part as a response to the difficult times currently affecting the shipping and shipbuilding sectors. Central aspects of these problems will be discussed at the series of high-powered professional conferences being arranged as usual in conjunction with Nor-Shipping '83.

The conferences
Three separate sessions are planned for 7th-8th June, covering the future role of supertankers, forces at play and new trends in economic development and trade during the 1980's, and world shipping over the next decade. These topics will be addressed by speakers of world-wide repute, and the two-day programma is expected to attract a number of Norwegian and international experts.
Staged at the Sjølyst Exhibition Centre in Oslo, Nor-Shipping has long enjoyed a reputation as one of the world's leading shipping exhibitions and conferences. Fresh evidence of this solid position has been provided by the large amount of stand space firmly booked for this year's event. Only a limited part of the 10.300 sq.m. available remains to be filled.
Bookings have been received from nearly 200 firms from Denmark, East Germany, Finland, France, Italy, Japan, Korea, Sweden, the Netherlands, Norway, Portugal, the USA, the UK, West Germany and Yugoslavia.
As in previous years, the biennial show is being organized by the Norwegian Trade Fair Foundation in close collaboration with the Norwegian Shipowners' Association and the Export Council of Norway.

For information contact:
Mrs. R. Drubbel
Norwegian Export Council
Prinsessegracht 6a
2514 AN Den Haag
tel. 070-451900

NEDERLANDSE VERENIGING VAN TECHNICI OP SCHEEPVAARTGEBIED
(Netherlands Society of Marine Technologists)

Voorlopig programma van lezingen en evenementen in het seizoen 1982/1983

HET ONTWERP EN DE INSTALLATIE VAN ELEKTRISCHE SYSTEMEN AAN BOORD VAN SCHEPEN MET HET OOG OP HET BEPERKEN VAN DE GEVOLGEN VAN BRAND
door ir. W. de Jong, e.i., Senior Electrical Engineer Surveyor to Lloyd's Register of Shipping te Rotterdam
wo. 13 apr. Amsterdam
do. 14 apr. Rotterdam
do. 21 apr. Vlissingen (afd. vergadering)

JAARDINER EN VIERING VIJFDE LUSTRUM AFDELING GRONINGEN
za. 16 apr. in Hotel-Restaurant 'Lauswolt' te Beetsterzwaag

ALGEMENE LEDENVERGADERING
wo. 27 apr. te Rotterdam

DE MIJNENJAGER 'ALKMAAR'**
Sprekers nader op te geven
di. 10 mei. **Delft** voor de afdeling Rotterdam

NB
Dit programma zal in de komende maanden worden aangevuld en eventueel gewijzigd.

**** Lezing in samenwerking met de Sectie Scheepstechniek van het Klvl en het Scheepsbouwkundig Gezelschap 'William Froude'.**

1. **De lezingen in Amsterdam worden gehouden in het instituut voor Hoger Technisch en Nautisch Onderwijs, Schipluidenlaan 20, Amsterdam, aanvang 17.30 uur.**
2. **De lezing in Delft wordt gehouden in de aula van de TH, Mekelweg 2, Delft, aanvang 20.00 uur.**
3. **De lezingen in Rotterdam worden gehouden in de Clauszaal van het Groothandelsgebouw, Stationsplein 45, aanvang 20.00 uur.**
4. **De lezingen in Vlissingen worden gehouden in het Maritiem Hotel Britannia, Boulevard Evertsen 244, aanvang 19.30 uur.**

VERENIGINGSNIEUWS

Ballotage

De volgende heren zijn voor het GEWOON LIDMAATSCHAP de Ballotage-Commissie gepasseerd:

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SWTK (met diploma B) bij Van Nievelt, Goudriaan & Co. B.V.
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Voorgesteld door P. van der Neut
Afdeling Rotterdam

Ing. J. BEERS
Manager Service en Reparatie afdeling SWD
v.d. Helmstraat 217, 3067 HE Rotterdam
Voorgesteld door J. G. Th. Huis in 't Veld
Afdeling Rotterdam

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Directeur Brons Industrie N.V., Appingedam
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Afdeling Groningen

J. F. DE HEER
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Voorgesteld door H. Heyveld
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Allen voorgesteld door P. C. de Haan

Eventuele bezwaren, schriftelijk binnen 14 dagen aan het Algemeen Secretariaat van de NVTS, Heemraadssingel 193, 3023 CB Rotterdam.

Symposium 'Nederland en de rijkdommen van de zee'

De Stichting Toekomstbeeld der Techniek organiseert op 14 april a.s. in De Doelen te Rotterdam een symposium over Nederland en de rijkdommen van de zee: industrieel perspectief en het nieuwe zeerecht.
PROGRAMMA:
09.15 uur
Ontvangst van de deelnemers, koffie
10.00 uur
Welkomstwoord
dr. ir. A. E. Pannenborg
10.05 uur
Opening
drs. G. M. V. van Aardenne
10.30 uur
Koffiepauze
11.00 uur
Presentatie tijdens vijf parallelzittingen van de resultaten van de studiesectoren:
1. Voedselwinning uit zee;
2. Olie en gas in diep water;
3. Zeemijnbouw;
4. Duurzame energiebronnen op zee;
5. Beheersing van het zeemilieu.

12.30 uur
Lunch
13.45 uur
Het nieuwe zeerecht
prof. dr. A. W. Koers
14.15 uur
Beslissen over mariene innovatie
prof. dr. ir. L. van Gunsteren
14.45 uur
Hoe benut Nederland nieuwe mogelijkheden op zee?
Paneldiscussie
ir. N. Dost, ir. J. W. Hillege,
ir. A. N. Neumann,
dr. E. W. van Spiegel,
ir. Th. J. Tienstra, F. H. P. Trip
prof. dr. ir. G. Vossers (voorzitter)
Kosten inclusief lunch ƒ 195,-.
Nadere inlichtingen: Congresbureau KIvI, Prinsessegracht 23, Den Haag. Telefoon: 070-646800.

WEST EUROPEAN CONFERENCE ON MARINE TECHNOLOGY – WEMT 84
Optimizing Maritime Operations – Paris July 1984

In the present worldwide recession which is particularly marked in the shipbuilding and shipping industries, and with the current high costs of materials, labour and oil fuel it is essential that the efficiency of all stages of ship design, construction, maintenance and operation is continually improved.
As the search for and the exploitation of new offshore gas and oil fields moves into deeper waters, so the magnitude of the investment and the complexity of the equipment and procedures increases. The margin between success and failure becomes ever smaller, emphasizing again the importance of maximizing efficiency in every aspect of the design and operation of offshore structures and their equipment.
It is against this background that the fourth West European Conference on Marine Technology to be held in Paris in July 1984 will have the single, all-important theme 'Optimizing Maritime Operations'. Sponsored by twelve institutions of naval architects and marine engineers from ten countries, the technical programme for WEMT 84 is expected to contain significant papers covering market expectations for the shipbuilding and offshore industries; research and development of hulls, propellers and machinery systems for economic operation; computer aided design and production of ships; total transport system considerations; and a special session devoted to the design, development, construction and operation of offshore structures in deep, exposed waters.
WEMT 84 will contain material of vital concern to the shipbuilding, shipping and offshore industries. Further details will be given in future issues.

Verkochte schepen

Annette

Via bemiddeling van Supervision Shipping & Trading Company te Rotterdam, is het Nederlandse m.v.s. *Annette*, eigendom van L. Davids Scheepvaartbedrijf B.V. te Delfzijl, verkocht aan Holtrade Shipping B.V. te Heerenveen. Het schip werd gebouwd in 1976 te Lemmer, meet 3.820 ton dw en is uitgerust met een Deutz hoofdmotor van 2500 pk.
De overdracht heeft inmiddels te Slikkerveer plaatsgevonden en het schip is herdoopt in *Samsun Dawn*.

Technische Informatie

Bekendmaking aan de scheepvaart van DGSM/SI *No. 177/1983 Brandveiligheidsmaatregelen voor vrachtschepen van 500 ton of meer, geen tankschepen zijnde.*
Door IMO zijn per Resolutie aanbevelingen vastgesteld voor brandveiligheidsmaatregelen voor vrachtschepen, geen tankschepen zijnde. Deze maatregelen maken als voorschriften deel uit van de eerste set amendementen op SOLAS 1974, welke waarschijnlijk op 1 september 1984 van kracht zullen worden.
Teneinde vóór genoemde datum de gewenste ervaring op te doen met die maatregelen wordt in de Bekendmaking aanbevolen reeds thans te voldoen aan de bepalingen van de IMO Resolutie, welke in twee bijlagen van de Bekendmaking zijn vermeld.
Ter verduidelijking zij vermeld dat de maatregelen, die voornamelijk van constructieve aard zijn en die te zijnertijd in Bijlage IV van het Schepenbesluit 1965 zullen worden opgenomen, dan alleen van toepassing zullen zijn op 'nieuwe' schepen, d.w.z.

op schepen, waarvan de kiel is gelegd op een nader te bepalen datum (vermoedelijk 1 september 1984) of die na een nader te bepalen overeenkomstige datum zullen zijn opgeleverd.
De wenselijkheid van het opdoen van de nodige ervaring werd aanwezig geacht in de besprekingen met het bedrijfsleven, die naar aanleiding van de nieuwe maatregelen zijn gevoerd, daar de bepalingen van de Resolutie van wezenlijk andere aard zijn dan de huidige voorschriften.
Bovendien zijn zij in technisch opzicht beduidend gecompliceerder.
Hoewel van een beperkt aantal Nederlandse en buitenlandse werven verwacht kan worden dat zij over de know-how en technologie terzake beschikken, zal dit zeker niet voor alle werven gelden.
Bij de Bekendmaking, waarvan alleen het formele gedeelte in de Nederlandse Staatscourant is gepubliceerd, behoren twee bijlagen.
Bijlage A bevat algemene brandveiligheidsvoorschriften voor vrachtschepen van 500 ton en meer, geen tankschepen zijnde, en Bijlage B bevat speciale maatregelen voor diezelfde categorieën van schepen welke bestemd zijn om gevaarlijke goederen te vervoeren.
Deze bijlagen, welke dus niet in de Nederlandse Staatscourant zijn gepubliceerd, zullen vanaf 1 april verkrijgbaar zijn bij de Scheepvaartinspectie te Rijswijk.

'Ship Abstracts' Database
Samsom Data Systemen B.V., Nederlandse host organisatie voor verscheidene databases, heeft in februari 'Ship Abstracts' online gebracht. Samsom is reeds host voor de databases 'Marna' en 'Shipdes' van het Nederlands Maritiem Informatie Centrum/CMO, 'Delft-Hydro' van het Waterloopkundig Laboratorium in Delft en 'Lisa' van de Library Association in Engeland.
De database 'Ship Abstracts', samengesteld door het Scheepsonderzoek Instituut in Noorwegen, bevat informatie over literatuur op het gebied van scheepstechnologie en offshore industrie, verwerkt in bibliografische referenties en uittreksels (ongeveer 22.500 items), die uit ongeveer 500 periodieken en congresverslagen zijn geselecteerd vanaf 1973 tot heden.
Jaarlijks breidt het bestand zich uit met 3.000 items.
Enkele voorkomende onderwerpen zijn:
- Scheepsbeschrijvingen.
- Ontwerpen en bouwen van schepen.
- Onderhoud en reparatie van schepen.
- Scheepsbouwindustrie.
- Scheepswerven, -dokken en -hellingen.
- Havens en waterwegen.
- Vervuilingscontrole.
- Bouwen op zee.
- Navigatie.
- Scheepsbeveiliging.
- Visserijtechnologie.
- Motoren.

Diversen

Meer schepen opgelegd
Eind vorig jaar waren er over de hele wereld 1549 schepen van in totaal 83,7 miljoen ton draagvermogen opgelegd. De opgelegde tonnage is nog nooit zo groot geweest, zo heeft de Britse raad voor de scheepvaart bekendgemaakt.
Alleen al in december werden er zestig schepen van in totaal 2,2 miljoen ton opgelegd. December was de zevende achtereenvolgende maand waarin de tonnage van opgelegde schepen groter was dan in een voorgaande maand. In totaal is twaalf procent van de wereldkoopvaardijvloot nu niet in gebruik.
Van de tankervloot is nu bijna eenvijfde opgelegd, namelijk 403 tankers van in totaal 60,1 miljoen ton. Van de vloot van schepen voor droge lading is zeven procent opgelegd, 1146 schepen van 23,6 miljoen ton. Griekenland heeft het meest te lijden van de malaise in de koopvaardij. Van de Griekse handelsvloot is 29 procent opgelegd.

ED. 17-2-'83

Binnenvaartwerven vrezen concurrentievervalsing
De kleinere scheepsbouw- en -reparatiebedrijven maken zich zorgen over de ontwikkelingen binnen het RSV concern voor zover deze betrekking hebben op werven die zich bezig houden met de reparatie van binnenvaartschepen.
Wanneer aan deze RSV werven op enigerlei wijze steun wordt verleend leidt dit tot concurrentievervalsing.
In de sector binnenvaartschepen is al geruime tijd sprake van overcapaciteit. Op 28 december j.l. hebben de gezamenlijke binnenvaartwerven aan minister Van Aardene een voorstel gedaan om die overcapaciteit te verminderen. Op dit voorstel heeft de bewindsman nog niet gereageerd. De kleinere scheepsbouw-en-reparatiebedrijven zijn van mening dat hun ingediende voorstel nu tegen de achtergrond van de ontwikkelingen bij RSV een bijzondere betekenis heeft gekregen.
Ten overvloede wordt er op gewezen dat onlangs ingediende steunaanvragen niet gehonoreerd zijn omdat het Ministerie van Economische Zaken vaststelde onvoldoende inzicht te hebben in de concrete situatie in deze bedrijfstak.

CEBOSINE

Westduitse scheepsbouw
De Westduitse scheepsbouwindustrie heeft in het afgelopen jaar 120 schepen van in totaal 614.000 brt ter waarde van DM 3,4 mrd afgeleverd, aldus het Verband der Deutschen Schiffbauindustrie in Hamburg. Dit betekent een tonnageteruggang van 13 pct ten opzichte van het voorgaande jaar. Het accent lag in het afgelopen jaar op de bouw van kleine tot middelgrote schepen, zodat de orderboeken van de kleine tot middelgrote werven er gezonder uitzagen dan die van de grote werven, ofschoon de werfindustrie als geheel een zeer moeilijke tijd doormaakte.
Eind 1982 gold voor 6765 werknemers op Westduitse scheepswerven arbeidstijdverkorting 'en een toeneming van dit aantal is onvermijdelijk'.
In het afgelopen jaar werd bij de Westduitse werven in totaal 565.000 brt aan nieuwbouwtonnage ter waarde van DM 3,5 mrd geboekt, hetgeen een vermindering van 26 pct in brutotonnage betekent.
De werven hebben bij de overheid een subsidie van 5 pct bepleit voor orders die door Westduitse reders bij Westduitse werven worden geplaatst. De regering in Bonn en en de Westduitse kuststaten zijn het echter niet eens over de vraag, wie deze speciale subsidie moet betalen.

DS. 7-2-'83

De Noordduitse werven
In kringen van de Duitse vakbonden, de politieke partij SPD en de betrokken ondernemingsraden gaan veel stemmen op om binnenkort een conferentie te houden over de toekomst van de Noordduitse scheepswerven. Bovenaan op de agenda zou daarbij staan een complete fusie tussen vijf werven, twee in Bremen, twee in Hamburg en een in Emden.
Na de eerdere suggestie om de Bremense werven AG 'Weser' en Bremer Vulkan te laten fuseren is nu geopperd om een en ander nog verder door te voeren en over te gaan tot de oprichting van een soort 'United Shipyard Company of North Germany'.
Behalve de twee eerdergenoemde Bremense werven (inclusief een AG 'Weser' lokatie in Seebeck) zouden daarvan deel uitmaken: Blohm & Voss en Howaldtswerke-Deutsche Werft in Hamburg en Thyssen Nordseewerke in Emden. Ook de scheepsnieuwbouw in Hamburg kampt met enorme problemen, vooral HDW, waar de banen van 4000 werknemers in gevaar zijn. In het recente verleden heeft men de orderleegloop mede bestreden door het accepteren van niet kostendekkende contracten. Zo zou HDW op het Hapag-Lloyd containerschip 'Frankfurt Express' DM 50 mln en op het cruise-schip 'Astor' DM 27 mln hebben verloren.
Aan de conferentie over de toekomst van de Noordduitse scheepswerven zou behalve door de politieke partijen, de vakbonden en de betrokken bedrijven ook moeten worden deelgenomen door de deelstaten Sleeswijk-Holstein, Bremen, Niedersachsen en door de stad Hamburg.

DS 24-2-'83

RZB hield een tankcoatingsymposium
Het Rotterdamsch Zandstraal- en Schildersbedrijf RZB heeft op 10 maart j.l.voor

ca 125 deelnemers, afkomstig uit diverse bedrijfstakken, een geslaagd tankcoating applicatie symposium gehouden.
Tankcoating heeft veelal een tweeërlei doel, te weten bescherming tegen de corroderende werking vanuit de lading op het tankmateriaal en bescherming van de lading tegen de corroderende werking van het tankmateriaal. Door de verfindustrie zijn hiervoor hoogwaardige verfsystemen ontwikkeld, die voor wat betreft het aanbrengen, hoge eisen stellen aan de voorbewerking van de ondergrond, conditionering van de tank en het vakmanschap van het aanbrengen. Slechts weinig straal- en schildersbedrijven zijn in staat onder die voorwaarden een goede tankcoating aan te brengen.
In de ochtendzitting gaven de heren Sjoer en Teeuwsen, resp. technisch directeur en technisch bedrijfsleider van het RZB een exposé over wat tankcoating is, de eisen te stellen aan de afwerking door de constructeur, de kwaliteitscontrole en de apparatuur die nodig is om een succesvolle tankcoating te kunnen aanbrengen. Duidelijk kwam hierbij tot uiting op welke indrukwekkende wijze het RZB deze zaken momenteel aanpakt.
De middagzitting bestond uit een levendige panel-discussie, waarbij het panel werd gevormd door de eerder genoemde sprekers, aangevuld met de heren ing. Berendsen van het Verfinstituut TNO en ing. Van Balen, verfexpert van de Gemeente Rotterdam, onder voorzitterschap van ir. Rijksen, algemeen directeur van RZB. Laatstgenoemde toonde zich in zijn slotwoord uiterst tevreden over dit symposium, een initiatief dat voor herhaling vatbaar is.

Kadercurssen Lastechniek 1983
Zo'n tien jaar geleden startte het AVAL-Lasinstituut de eerste cursus voor lastechnisch kader.
Thans zijn er elf korte, gerichte cursussen beschikbaar. Vijf voor staffunctionarissen (inspecteurs, constructeurs en adviseurs) t.w.: Toezicht en Inspectie / Tekenkamer en Bedrijfsburo / Veiligheid en Hygiëne / Vorming en Opleiding / Management Lassen en Snijden. Zes voor lijnfunctionarissen (chefs, bazen, voorlieden en aspirantleermeesters) t.w.: Autogeen Lassen / Autogeen Hardsolderen / Autogeen Snijden / Elektrisch booglassen / MIG en TIG gasbooglassen.
De cursussen worden in vóór- en najaar in de uitstekend geoutilleerde ruimten van het AVAL-Lasinstituut te Rotterdam verzorgd. Nadere informatie: AVAL, Postbus 81130, 3009 GC Rotterdam. Tel. 010-217211.

Offshore Europe 1983.
The Society of Petroleum Engineers will be the official sponsor of this year's Offshore Europe to be held at Aberdeen from 6 tot 9 September. Earlier Offshore Europe meetings have benefited from local chapter involvement with the conference programme, but the new agreement means that the full resources of the Society will be behind the total event. The event remains under the patronage of the UK Offshore Operators Association.
Offshore Europe 83 will occupy 17 500 m^2 of covered space at the Bridge of Don Showground and more than 700 exhibitors are expected to take part. All exhibitors have to comply with regulations laid down by the organisers about the types of company acceptable as exhibitors, preference being given to companies with equipment and services of most interest to the technical and operating management of oil companies, drilling contractors, project management contractors and marine construction companies.
The 1983 Offshore Europe conference being held at the same time as the exhibition will focus on the operations associated with the development of offshore hydrocarbon resources with particular emphasis on North Sea activities.
The last event in 1981 attracted approximately 800 exhibitors from 16 countries. Approximately 21 000 visitors registered, the vast majority on season tickets, and almost one in five was from an oil exploration or production company.
More information from: Spearhead Exhibitions, 55 Fife Road, Kingston upon Thames, Surrey KT1 1TA, England.

Pan-American Naval Engineers Will Hold 1983 Meeting In Washington
The Eighth Congress of the Pan-American Institute of Naval Engineering (IPEN) will be held in Washington, D. C. (Hyatt Regency Hotel, Crystal City, Arlington, Virginia) Septemer 11-17, 1983.
In announcing plans for the meeting, the president of the western hemisphere organization of naval architects and marine engineers, said several hundred government, academia, and private industry representatives from maritime nations throughout the Americas are expected at the conference. Observers from a number of other world maritime nations are also anticipated to attend the meeting. It will be the first time for the Pan-American professional maritime group to hold its congress in the United States.

IPEN is a non-profit organization dedicated to the promotion of technical advancement of naval architecture, marine engineering and water transportation. Members of the society are engineers, architects, technicians and management personnel, both government and private industry, engaged in maritime activities. Headquarters of the organization is in Rio de Janeiro.

The Washington congress is structured to promote learning and resource exchange in the areas of shipbuilding and repair, ocean and inland water transportation naval science and research, standardization, information processing, off-shore construction, fishery management, and maritime education. The five day business sessions will include the presentation of professional papers, technical discussions, exhibits, and displays. Visits to the U.S. Naval Ship Research and Development Center and to the U.S. Naval Academy have been arranged. A variety of social activities for visitors to the United States capital city are planned. The United States Navy's Ship Systems Command the U. S. Society of Naval Architects and Marine Engineers (SNAME) will serve as hosts for the international gathering.
Additional information concerning registration and hotel reservation may be obtained by writing to IPEN Registration Center, P.O. Box 17413, Dulles International Airport, Washington, D. C. 20041.

One quarter of Norwegian merchant tonnage in lay-up
Well over one quarter of the tonnage in the Norwegian merchant fleet was in lay-up at end October '82 reports the Central Bureau of Statistics. The exact figures were 71 ships aggragating 5.5 million grt, or 26.7% of the entire tonnage of the merchant fleet. This compares with the 25.6% of ships in lay-up reported one month earlier.
Of these 71 ships, 55 were laid up in Norwegian ports with the remaining 16 in foreign ports.
The figures show a strong worsening of the lay-up situation in the past year. While the lay-up tonnage stood at 26.7% at end October 1982, the figure was only 11.5% one year ago.
Among the 71 ships in lay-up, 48 were tankers and 23 were dry cargo vessels.

Maritima 83, first Latin American Exhibition & Conference for Fishing and Maritime Industries
MARITIMA 83 will take place at the Hotel de Mexico, Mexico City, Aug. 23-26, 1983. The National Chamber of the Naval Industry and the National Chamber of the Fishing Industry will serve as co-sponsors of the event, and five organizations also will support the event. They are the Secretary of Fisheries, the National Bank for Fishing and Ports, the Mexican Commission for the Coordination of Ports, the National Commission for the Coordination of the Naval Industry, and the Mexican Institute of Foreign Trade.
Clapp & Poliak International and Expofer, S.A., Clapp & Poliak's partner in Mexico, will act as organizers of the exhibition.
A conference will convene concurrently with the exposition to deal with such subjects as the availability of technology, techniques and equipment to spur the development of the fishing and maritime industries. The National Chamber of the Naval Indus-

try will conduct its annual convention in conjunction with MARITIMA 83.
Among the products that will be demonstrated will be equipment and supplies for the fishing industry, for fish processing, packaging, distribution and retail display; shipyard equipment to build boats and equip them, with emphasis on engines; investment and technology for license in shipbuilding systems; salvage equipment; technology transfer for catching fish; marine communication and navigation equipment; dockside machinery and equipment and other port facilities, and ships for naval and fishing use.
Information about Maritima 83 may be obtained from Clapp & Poliak International, P.O. Box 70007, Washington, D.C. 20088, U.S.A.

Centenary of Engineers and Shipbuilders Institute

The North East Coast Institution of Engineers and Shipbuilders, world renowned as a learned society, is planning a major celebration of its centenary in 1984.
The centrepiece will be a three-day international conference on marine propulsion to be held in Newcastle upon Tyne during the week of 14-18 May 1984. It is expected to attract several hundred delegates from many countries.
The conference will be supported by exhibitions of technical and historical interest, visits to local industry and research establishments, and sightseeing excursions to places of historic interest in Northumbria.
'The NEC is one of the oldest marine institutions in the world and, as such, has played an important part in advancing technical knowledge in the shipbuilding and engineering industries,' said Mr. Oscar Clemmetsen, president.
'While we are a small institution compared with some others, we are nevertheless a lively organization with members in some 40 countries. Since our inception, we have presented about 1300 papers among them many outstanding contributions to naval architecture and marine engineering.
'This institution has made a major contribution to the advancement of industry not only in this region but throughout the world and we feel its centenary should be fittingly celebrated,' he added.
The 'North East Coast' as it is affectionately known, was founded in 1884, the year in which Sir Charles Parsons, an early eminent member who became president, was granted a patent for his invention of the steam turbine.
It is appropriate that marine propulsion will be the subject of the centenary conference and leading international figures in this field are being invited to take part. Papers will embody recent developments and new concepts relating to the engine-hull-propeller system. (LPS)

Ships delivered by Norwegian yards in 1982

The value of ships delivered from Norwegian yards last year was about 885 million USD – 285 million USD more than in the year before. The export value of new ships was 214 million USD compared with about 95 million USD in 1981, announced the chairman of the Norwegian Shipbuilders' Association.
The major increase in the value of deliveries is partly the result of inflation and partly due to the fact that the number of advanced special ships with costly equipment was higher than in 1981. The figures therefore represent no increase in the capacity utilization.
The number of employees at the member concerns of the Shipbuilders' Association was 20 380 at the start of this year, 900 of whom were laid off. 6 390 employees were engaged in the newbuilding sector. This represent a reduction of almost 60% since the years before the crisis in the shipbuilding industry started.
However, a considerable restructuring has taken place during this period, covering such things as the transition to offshore activity, so that actual reduction in the number of employees is 27%.
If the results of this disagreement within OPEC are a drastic fall in the price of crude, this can have unfortunate effects for activities in the North Sea. But such a development can also give rise to a general upturn in world economy and create fresh optimism in shipping.

Scheepsreparatie Wilton werkt weer hard door.

Bij Wilton-Fijenoord in Schiedam is al geruime tijd een levendig herstel van de scheepsreparatie-activiteiten op de werf te bespeuren. Onder het ouderwetse motto van 'we gooien de beuk er weer keihard in' wordt er met veel inzet aan de orderportefeuille gewerkt.
Door de negatieve berichtgeving in de buitenlandse pers over de RSV-betalingsperikelen leken sommige reders aanvankelijk wat kopschuw gemaakt, omdat uit bewuste berichtgeving allerminst duidelijk bleek, dat surséance van betaling een wettelijke mogelijkheid is om erger te voorkomen.
Maar gelukkig kon Wilton met de bewindvoerders tot een regeling komen, waardoor bij de onderleveranciers weer bestellingen door de werf kunnen worden gedaan, die noodzakelijk zijn voor de bedrijfsvoortgang van de werf. Hiervan is voldoende vertrouwen uitgegaan naar de buitenlandse en binnenlandse reparatie-opdrachtgevers van de werf (de rederijen e.d.) om hun schepen naar Schiedam te zenden voor reparatie- en onderhoudswerkzaamheden. Ondanks het teruglopen van de wereldhandel heeft de werf verleden jaar toch met een redelijke bezetting kunnen draaien en hoopt dit op een zelfstandige basis nog decennia lang te kunnen volhouden.
De werf stelt daarbij: 'Het vertrouwen in het bedrijf is geschokt geworden, maar het herstelt zich nu zienderogen. Op dit herstel van vertrouwen moet zich nu een deel van onze inspanningen richten. Ons werk ligt in de dienstverlenende sfeer en moet voor het overgrote deel uit het buitenland komen. Vertrouwensrelaties spelen daarin een belangrijke rol. Slechts door 100% werk te leveren en op tijd, kan het geschokte vertrouwen worden teruggewonnen. Een proces dat niet alleen al is ingezet, maar ook waarneembaar aan het doorzetten is, omdat de orderportefeuille er op dit moment niet ongunstig uitziet.'

Freight Show Europe 83

De Freight Show Europe, die van 31 mei t/m 3 juni 1983 in het Ahoy' Complex te Rotterdam zal plaatsvinden, is in vergelijking met het vorige jaar aanzienlijk gegroeid. Meer dan een 150-tal bedrijven en instellingen uit binnen- en buitenland op het gebied van lucht-, zee-, rail-, en wegtransport, stuwadoors (massagoed, stukgoed en containers), cargadoors, expediteurs, verhuurbedrijven en dergelijke zullen acte de présence geven.
Vorig jaar bedroeg de oppervlakte 3.500 m^2, terwijl voor dit jaar ± 12.000 m^2 gerealiseerd zal worden.
Gelijktijdig met de Freight Show Europe zullen de Internationale Rotterdamse Havendagen plaatsvinden. Meerdere noviteiten zoals een door Nedlloyd nieuw ontwikkelde geventileerde container, moderne havencommunicatie/informatie-systemen (Transpotel) en nieuwe vervoerstechniek op het gebied van de binnenvaart zullen worden getoond.
Tevens zal er onder auspiciën van de Stichting Havenbelangen, Tennatio Tentoonstellingen en Transpotel een ééndagscongres onder het thema 'Videotex, Informatie communicatie voor Haven en Transport', worden georganiseerd.
Voor verdere informatie kunt u contact opnemen met: FREIGHT SHOW EUROPE Ahoy' Zuiderparkweg 20-30, 3084 BB Rotterdam, Telefoon: 010-812122 Telex: 28977.