Chapter 19 Table of minimum requirements, insert an asterisk in column "a" for Ethylene oxide - propylene oxide mixtures with ethylene oxide content of not more than 30% by weight.

Add the following to the table of the summary of minimum requirements:

a	b	c	d	e	f	g	h	i
Pentanes (all isomers)*	1265	2G/2PG	-	-	F	R	310	14.4.4, 17.10, 17.12
Pentene (all isomers)*	1265	2G/2PG	-	-	F	R	310	14.4.4, 17.10, 17.12

Delete the reference to "Chapter 19" after paragraph 18.2.1 and at the top of page 13.

Appendix

Model form of certificate, footnote 5, third line, insert "or their compatible mixtures having physical proportions within the limitations of tank design" between "Code" and "should".

第 53/2015 號行政長官公告

中華人民共和國是國際海事組織的成員國及一九七四年十一月一日訂於倫敦的《國際海上人命安全公約》（下稱“公約”）的締約國；

國際海事組織大會於一九九三年十一月四日透過第A.744（18）號決議通過了《散貨船和油輪檢驗期間的強化檢查方案指南》；

國際海事組織海上安全委員會於一九九六年六月四日透過第MSC.49（66）號決議通過了上指指南的修正案，該修正案自一九九九年十二月二十日起適用於澳門特別行政區；

基於此，行政長官根據澳門特別行政區第3/1999號法律第六條第一款的規定，命令公佈包含上指修正案的第MSC.49（66）號決議的中文及英文文本。

二零一五年五月十一日發佈。

行政長官　崔世安

Aviso do Chefe do Executivo n.º 53/2015

Considerando que a República Popular da China é um Estado Membro da Organização Marítima Internacional e um Estado Contratante da Convenção Internacional para a Salvaguarda da Vida Humana no Mar, concluída em Londres em 1 de Novembro de 1974, adiante designada por Convenção;

Considerando igualmente que, em 4 de Novembro de 1993, a Assembleia da Organização Marítima Internacional, através da resolução A.744(18), adoptou as Directrizes relativas ao Programa Reforçado de Inspecções no âmbito das Vistorias a Graneleiros e Petroleiros;

Mais considerando que, em 4 de Junho de 1996, o Comité de Segurança Marítima da Organização Marítima Internacional, através da resolução MSC.49(66), adoptou emendas às referidas Directrizes, e que tais emendas são aplicáveis na Região Administrativa Especial de Macau desde 20 de Dezembro de 1999;

O Chefe do Executivo manda publicar, nos termos do n.º 1 do artigo 6.º da Lei n.º 3/1999 da Região Administrativa Especial de Macau, a resolução MSC.49(66), que contém as referidas emendas, nos seus textos em línguas chinesa e inglesa.

Promulgado em 11 de Maio de 2015.

O Chefe do Executivo, *Chui Sai On*.

第 MSC.49（66）號決議

（1996 年 6 月 4 日通過）

通過《散貨船和油輪檢驗期間的強化檢查方案指南》

（第 A.744（18）號決議）的修正案

海上安全委員會，

憶及《國際海事組織公約》關於本委員會職責的第 28（b）條，

還憶及第 A.744（18）號決議，大會以該決議通過了《散貨船和油輪檢驗期間的強化檢查方案指南》，

進一步憶及經修正的《1974 年海上人命安全公約》（《安全公約》）關於上述指南修正程序的第 VIII（b）條和規則第 XI/2 條，

注意到第十八次大會在通過第 A.744（18）號決議時，要求海上安全委員會和海上環境保護委員會在應用該指南所取得的經驗的基礎上保持對其進行審查並作出必要的更新，

在其第 66 次會議上**審議了**按照《安全公約》第 VIII（b）（i）條所建議和分發的該指南的修正案，

1. 按照《安全公約》第 VIII（b）（iv）條，**通過了**該指南的修正案，其條文載於本決議的附件中；

2. 按照《安全公約》第 VIII（b）（vi）（2）（bb）條，**決定**該修正案應於 1998 年 1 月 1 日視為已被接受，除非在此日期之前，超過三分之一的《安全公約》締約政府或合計商船總噸位不少於世界商船總噸位 50%的締約政府通知其反對該修正案；

3. **請**締約政府注意，按照《安全公約》第 VIII（b）（vii）（2）條，該修正案應在其按照上述第 2 款被接受後於 1998 年 7 月 1 日生效；

4. **要求**秘書長依照《安全公約》第 VIII（b）（v）條將本決議和附件中的修正案文本的核證副本發送給《安全公約》的所有締約政府；

5. **進一步要求**秘書長將本決議及其附件的副本發送給非《安全公約》締約政府的本組織會員。

附件

《散貨船和油輪檢驗期間的強化檢查方案指南》

（第 A.744（18）號決議）的修正案

散貨船檢驗期間的強化檢查方案指南（第 A.744（18）號決議，附件 A）

1 在目錄中，以“5.1 檢驗方案”代替“5.1 計劃”。

2 在目錄的末尾增加下列條文：

“附件 9－強化散貨船檢驗計劃的相關技術評定指南。”

3 以“檢驗方案”代替第 5.1 段的小標題“計劃”。

4 在第 5.1.1 段加上下列一句：

“檢驗方案應為書面形式。”

5 以下列條文代替現有第 5.1.2 段：

“5.1.2 在制定檢驗方案時，應收集並查閱下列文件以選擇要檢查的液艙、貨艙、區域和結構構件：

－ 檢驗狀況和基本船舶信息；

－ 第 6.2 和 6.3 段所述的船上文件；

－ 主結構平面圖（總結構圖），包括有關高抗拉鋼材（HTS）的使用信息；

— 船級社和船東以前的有關檢驗和檢查報告；

— 有關船舶貨艙和液艙的使用、典型貨物的信息和其他有關資料；

— 有關新船防腐水平的信息；

— 關於營運期間有關維護水平的信息。”

6 將現有第 5.1.3 段重新編號為第 5.1.4 段。

7 刪去現有第 5.1.4 段。

8 增加下列新第 5.1.3 段：

“5.1.3 提交的檢驗方案要考慮到並至少符合附件 1 和 2 及第 2.7 段分別對細節檢驗、厚度測量和液艙測試的要求，還要包括至少以下方面的信息：

— 基本船舶信息和細節；

— 主結構平面圖（總結構圖），包括有關高抗拉鋼材（HTS）的使用情況；

— 貨艙和液艙平面圖；

— 帶有關於塗層的使用、保護和狀況信息的貨艙和液艙清單；

— 檢驗條件（例如：關於洗艙、除氣、通風和照明等的信息）；

— 進入結構物的規定和方法；

— 檢驗設備；

— 作細節檢驗的貨艙、液艙和區域的確定（附件 1 各項）；

— 作厚度測量部分的確定（附件 2 各項）；

— 作液艙測試的液艙確定（第 2.7 段各項）；和

— 與相關船舶有關的損壞經歷。”

9 增加下列新第 5.1.5 和 5.1.6 段：

“5.1.5 主管機關應通知船東適用於該船的最大可接受結構腐蝕減少量。

5.1.6 還可以利用附件 9 中所列的強化散貨船檢驗計劃的相關技術評定指南。這些指南是個建議的工具，如果主管機關認為必要且適當，可以在準備所要求的檢驗方案時自行援用。”

10 增加下列新附件 9：

“附件 9

強化散貨船檢驗計劃的相關技術評定指南

定期檢驗

1 前言

本指南包含可在強化散貨船特殊檢驗計劃時採用的有關技術評定信息和建議。如附件 A 第 5.1.6 段所指出的，本指南是個建議的工具，如果主管機關認為必要且適當，可以在準備所要求的檢驗方案時自行援用。

2 目的和原則

2.1 目的

本指南所述技術評定的目的在於幫助確定臨界結構區域、指定可疑區域和集中注意可能特別易損耗或損壞，或顯示有易損耗或損壞歷史的結構構件或結構構件區域。此信息可能有助於為厚度測量、細節檢驗和液艙測試指定位置、區域、貨艙和液艙。

2.2 最低要求

本指南不能用於降低附件 1 和 2 及附件 A 第 2.7 段分別對細節檢驗、厚度測量和液艙測試的要求，這些要求在所有情況下都應作為最低要求予以遵守。

2.3 時間安排

與檢驗計劃的其他方面一樣，本指南所述的技術評定應遠在定期檢驗開始前，即在開始檢驗前並通常至少在檢驗預定完成日期的 12 至 15 個月前，由船東或船舶經營人與主管機關合作完成。

2.4 要考慮的方面

對某一船舶下列方面的技術評定（可包括與可能的老化有關的風險的數量或質量評估），可用作指定要檢驗的貨艙、液艙和區域的基礎：

— 設計特徵，諸如各種結構構件的應力水平、設計細節和高抗拉鋼材的使用範圍；

— 該船及類似船舶（如有的話）有關腐蝕、裂縫、彎曲、凹陷和維修的歷史；和

— 與載運貨物的類型、液艙的保護及貨艙和液艙的塗層（如有的話）狀況有關的信息。

各種結構構件和區域的易損壞或易老化的有關風險的技術評定，應以經認可的原則和做法（諸如可在參考材料 3 中找到者）加以判別和確定。

3 技術評定

3.1 總則

有三種基本類型的可能損壞可能成為與檢驗計劃相關的技術評定對象：腐蝕、裂縫和彎曲。檢驗計劃一般不包括接觸性破損，因為凹陷通常記錄在備忘錄中，並被認為需由驗船師作為例行工作加以處理。

檢驗計劃過程中進行的技術評定原則上應如圖 1 所示；該圖簡略地描繪了在制定檢驗計劃過程中如何進行技術評定。該方法係以基本與下述兩點有關的經驗和知識的評估為基礎：

.1 設計；和

.2 腐蝕。

設計應考慮到由於震動、高應力水平或疲勞而可能容易彎曲或裂縫的有關結構細節。

腐蝕與老化過程有關，且與新造時的防腐質量和在使用壽命期間的後續維護密切相關。腐蝕也可導致裂縫和/或彎曲。

3.2 方法

3.2.1 設計細節

與該船或類似船舶有關的破損經歷（如有的話），是計劃過程中所使用的主要信息來源。此外，還應包括從設計圖紙中選擇的結構細節。

需要考慮的典型破損經歷包括：

— 裂縫的數目、範圍、位置和頻率；和

— 彎曲的位置。

此信息可以在檢驗報告和/或船東的檔案，包括船東自己檢查的結果中找到。對這些缺陷應予分析、記錄並標在草圖上。

此外，還應利用一般經驗。例如，圖 2 給出了經驗表明散貨船上可能易受結構破損的典型位置。還應參閱載有各種散貨船結構細節典型破損和建議維修方法一覽表的參考資料 3。

這些圖應結合審查主結構圖使用，以便與實際結構相比較並查出可能易受破損的類似細節。圖 3 給出了一個例證。

對主結構圖的審查，除使用上面提到的圖以外，還應包括核查經歷過裂縫的典型設計細節。對導致破損的因素應予以仔細研究。

高抗拉鋼材（HTS）的使用是一個重要因素。使用普通、低碳鋼材一直處於良好工作狀態的詳情表明，在採用高抗拉鋼材及其較高的相關應力時，可能更容易破損。高抗拉鋼材廣泛用於甲板和船底結構的縱向材料，且對其使用一般有良好的經驗。在其他位置，如船側結構，動態應力可能較高，使用高抗拉鋼材則不夠有利。

在這一點上，按有關方法對典型和重要構件及細節進行應力計算可能是有益的，並應予以考慮。

應記錄下在此過程中確定的選擇結構區域，並把它們標在將納入檢驗方案的結構圖上。

3.2.2 腐蝕

為了評估有關的腐蝕危險，通常要考慮以下信息：

- 液艙、貨艙和處所的使用
- 塗層狀況
- 陽極狀況
- 清洗程序
- 先前的腐蝕破損
- 貨艙壓載的使用和時間
- 貨艙和壓載艙的腐蝕危險
- 與加熱燃油艙相鄰的壓載艙位置。

參考材料 2 通過使用典型狀況圖片，給出了可用於判定和描述塗層狀況的明確範例。

對於散貨船，應把參考材料 3 與船齡和從為準備檢驗方案而收集的信息中取得的有關船舶狀況預測信息作為評估的基礎。

應將各種液艙、貨艙和處所與相應指定的腐蝕危險一併列出。

3.2.3 細節檢驗和厚度測量的位置

在腐蝕危險和設計經驗評估表的基礎上，可以指定初次細節檢驗和厚度測量（部分）的位置。

須進行厚度測量的部分通常應指定在腐蝕危險被判定為最高的液艙、貨艙和處所。

對需進行細節檢驗的液艙、貨艙和處所的指定，最初應以最高腐蝕危險為基礎，並應始終包括壓載艙。選擇的原則應為：船齡越大範圍越大，或者，信息不充分或不可靠的地方範圍增加。

參考材料

1 油輪結構合作論壇：《油輪結構檢驗和狀況評估指導手冊，1986》；

2 油輪結構合作論壇：《油輪結構狀況評估和維護，1992》；

3 國際船級社協會：《散貨船：船殼結構檢驗、評估和維護指南，1994》。

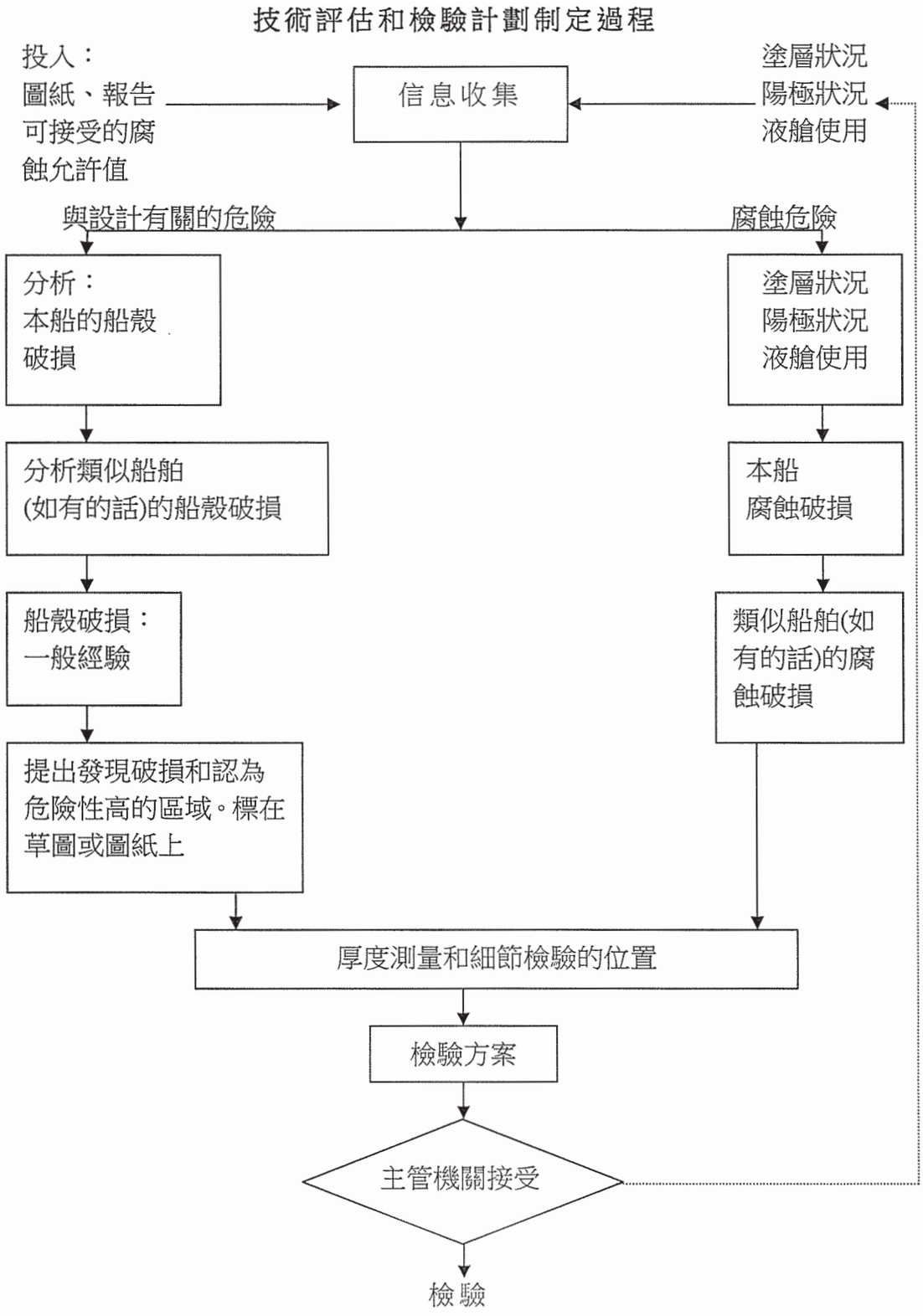


圖 1：計劃制定過程－技術評估和檢驗

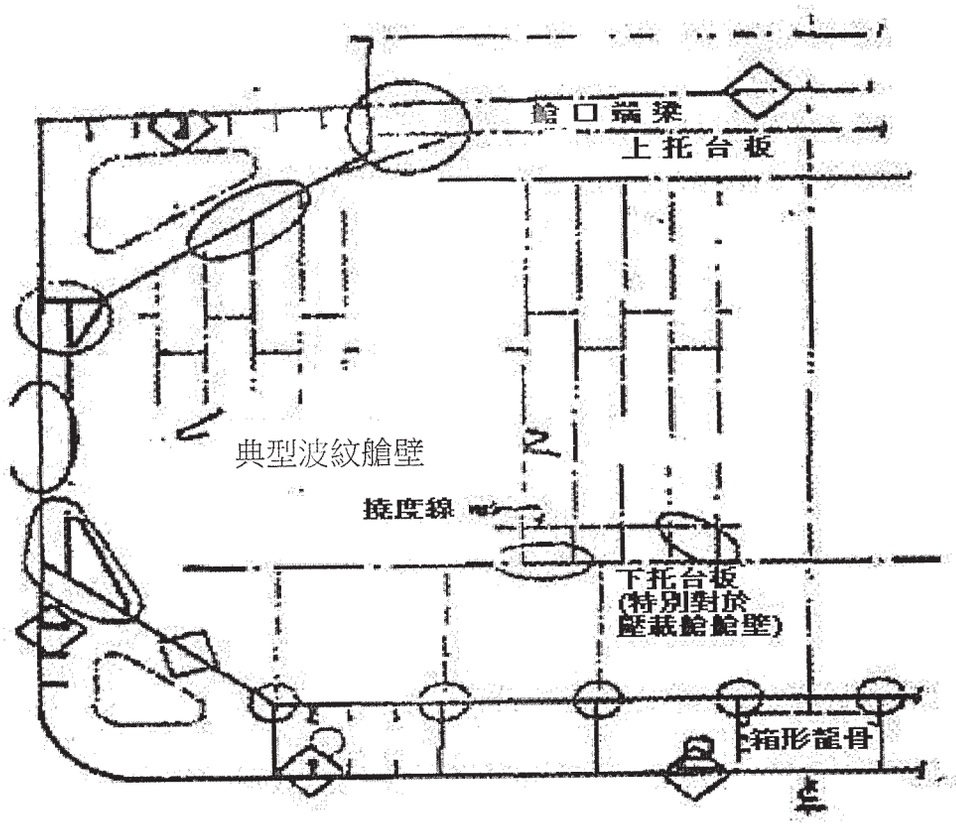
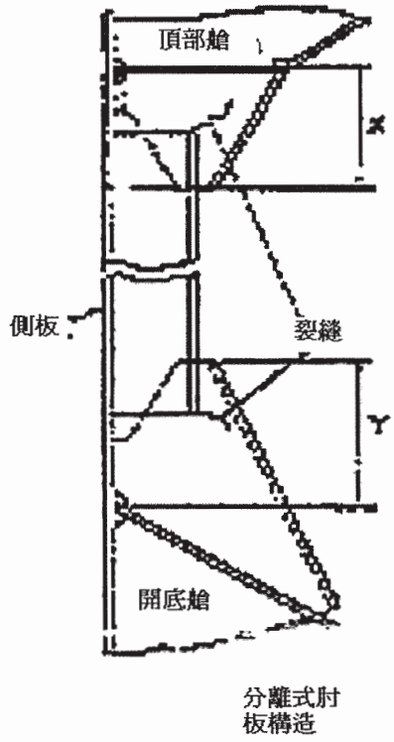
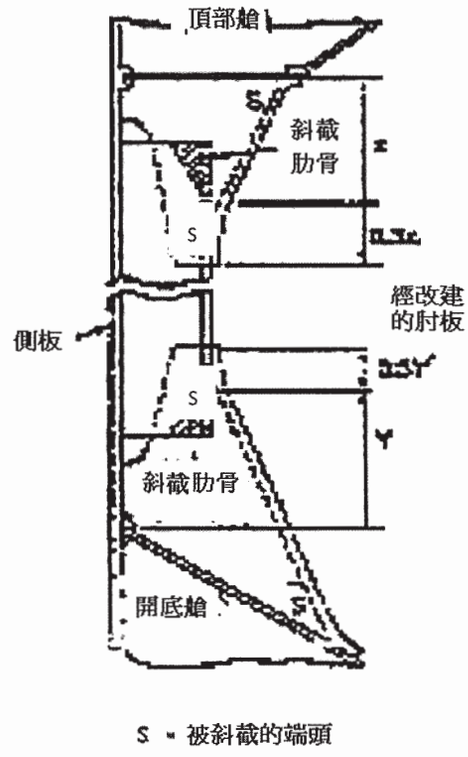


圖 2：易受結構破損或腐蝕的典型位置

區域 1	結構項目	船殼側肋骨和端肘板（分離式肘板構造）	例 1
破損細節		肋骨末端肋板裂縫	
破損情況草圖		修理草圖	





破損的可能原因/修理記錄

1 此類破損是由於應力集中。

2 對於小裂縫，如髮狀裂縫，可以沿裂縫刻出“V”形槽，熔焊後磨平，再通過無損探傷進行檢查。

3 對於較大/顯著裂縫，應考慮進行切割並部分/全部更新肋骨肘板。如更新肘板，肋骨端部可定形為能使其變軟。

4 為謹慎起見，連接邊艙的肘板邊緣要加焊低硬度焊趾。

5 注意邊艙延伸肘板臂結構，即在沿肘板臂的方向提供了加強板。

圖 3：典型破損和維修舉例（引自參考材料 3）

油輪檢驗期間的強化檢查方案指南（第 A.744（18）號決議，附件 B）

11 在目錄中，以“5.1 檢驗方案”代替“5.1 計劃”。

12 在目錄的結尾增加下列條文：

“附件 11－制定強化油輪檢驗計劃的相關技術評定指南”。

13 以“檢驗方案”代替第 5.1 段的小標題“計劃”。

14 在第 5.1.1 段加上下列一句：

“檢驗方案應為書面形式。”

15 以下列條文代替現有第 5.1.2 段：

“5.1.2 在制定檢驗方案時，應收集並查閱下列文件以選擇要檢查的液貨艙、區域和結構構件：

－ 檢驗狀況和基本船舶信息；

－ 第 6.2 和 6.3 段所述的船上文件；

－ 主結構平面圖（總結構圖），包括有關高抗拉鋼材（HTS）的使用情況；

－ 船級社和船東以前的有關檢驗和檢查報告；

－ 有關船舶液貨艙的使用信息、典型貨物和其他有關資料；

－ 有關新船防腐水平的信息；和

－ 關於營運期間有關維護水平的信息。”

16 將現有第 5.1.3 段重新編號為第 5.1.4 段。

17 刪去現有第 5.1.4 段。

18 增加以下新第 5.1.3 段：

“5.1.3 提交的檢驗方案要考慮到並至少符合附件 1、2 和 3 分別對細節檢驗、厚度測量和液艙測試的要求，還要包括至少以下方面的有關信息：

－ 基本船舶信息和細節；

－ 主結構平面圖（總結構圖），包括有關高抗拉鋼材（HTS）的使用情況；

－ 液貨艙平面圖；

－ 帶有關於塗層的使用、保護和狀況信息的液貨艙清單；

－ 檢驗條件（例如：關於洗艙、除氣、通風和照明等的信息）；

－ 進入結構物的規定和方法；

－ 檢驗設備；

－ 作細節檢驗的液貨船和區域的確定（附件 1 的各項）；

－ 作厚度測量的部分的確定（附件 2 的各項）；

－ 作液艙測試的液艙的確定（附件 3 的各項）；和

－ 與相關船舶有關的破損經歷。”

19 增加下列新第 5.1.5 和 5.1.6 段：

“5.1.5 主管機關應通知船東適用於該船的最大可接受結構腐蝕減少量。

5.1.6 還可以利用附件 11 中所列的制定強化油輪檢驗計劃的相關技術評定指南。這些指南是個建議的工具，如果主管機關認為必要且適當，可以在準備所要求的檢驗方案時自行援用。”

20 增加下列新附件 11：

“附件 11

強化油輪檢驗計劃的技術評定指南

定期檢驗

1 前言

本指南包含可在強化油輪特殊檢驗計劃時採用的有關技術評定信息和建議。如附件 B 第 5.1.6 段所指出的，本指南是個建議的工具，如果主管機關認為必要且適當，可以在準備所要求的檢驗方案時自行援用。

2 目的和原則

2.1 目的

本指南所述技術評定的目的在於幫助確定臨界結構區域、指定可疑區域和集中注意可能特別易損耗或損壞，或顯示有易損耗或損壞歷史的結構構件或結構構件區域。此信息可能有助於為厚度測量、細節檢驗和液艙測試指定位置、區域和液貨艙。

2.2 最低要求

本指南不能用於降低附件 1、2 和 3 分別對細節檢驗、厚度測量和液艙測試的要求，這些要求在所有情況下都應作為最低要求予以遵守。

2.3 時間安排

與檢驗計劃的其他方面一樣，本指南所述的技術評定應遠在定期檢驗開始前，即在開始檢驗前並通常至少在檢驗預定完成日期的 12 至 15 個月前，由船東或船舶經營人與主管機關合作完成。

2.4 要考慮的方面

對某一船舶下述方面的技術評定（可包括與可能的老化有關的風險的數量或質量評估），可用作指定要檢驗的液貨艙和區域的基礎：

— 設計特徵，諸如各種結構構件的應力水平、設計細節和高抗拉鋼材的使用範圍；

— 該船及類似船舶（如有的話）有關腐蝕、裂縫、彎曲、凹陷和維修的歷史；和

— 與載運貨物的類型、使用不同的液艙裝貨/壓載、液艙的保護及塗層狀況（如有的話）有關的信息。

各種結構構件和區域的易壞和老化的有關風險的技術評定，應以經認可的原則和做法（經認可參考材料 1 和 2 中找到者）加以判別和確定。

3 技術評定

3.1 總則

有三種基本類型的可能損壞可能成為與檢驗計劃相關的技術評定對象：腐蝕、裂縫和彎曲。檢驗計劃一般不包括接觸性破損，因為凹陷通常記錄在備忘錄中並被認為需由驗船師作為例行工作加以處理。

檢驗計劃過程中進行的技術評定原則上應如圖 1 所示；該圖簡略地描繪了在制定檢驗計劃過程中如何進行技術評定。該方法係以基本與下述兩點有關的經驗和知識的評估為基礎：

.1 設計；和

.2 腐蝕。

設計應考慮到由於震動、高應力水平或疲勞而可能容易彎曲或裂縫的有關結構細節。

腐蝕與老化過程有關，且與新造時的防腐質量和在使用壽命期間的後續維護密切相關。腐蝕也可導致裂縫和/或彎曲。

3.2 方法

3.2.1 設計細節

與該船或類似船舶有關的破損經歷（如有的話），是計劃過程中所使用的主要信息來源。此外，還應包括從設計圖紙中選擇的結構細節。

需要考慮的典型破損經歷包括：

— 裂縫的數目、範圍、位置和頻率；和

— 彎曲的位置。

此信息可以在檢驗報告和/或船東的檔案，包括船東自己檢查的結果中找到。對這些缺陷應予分析、記錄並標在草圖上。

此外，還應利用一般經驗，例如，應參閱參考資料 1，它收錄了各種油輪結構細節典型破損和建議維修方法一覽表。

這些圖應結合審查主結構圖使用，以便與實際結構相比較並查出可能易受破損的類似細節。圖 2 給出了一個例證。

對主結構圖的審查，除使用上面提到的圖以外，還應包括核查經歷過裂縫的典型設計細節。對導致破壞的因素應予以仔細研究。

高抗拉鋼材（HTS）的使用是一個重要因素。使用普通、低碳鋼材一直處於良好工作狀態的詳情表明，在採用高抗拉鋼材及其較高的相關應力時，可能更容易破損。高抗拉鋼材廣泛用於甲板和船底結構的縱向材料，且對其使用一般有良好的經驗。在其他位置，如船側結構，動態應力可能較高，使用高抗拉鋼材則不夠有利。

在這一點上，按有關方法對典型和重要構件及細節進行應力計算可能是有益的，並應予以考慮。

應記錄下在此過程中確定的選擇結構區域，並把它們標在將納入檢驗方案的結構圖上。

3.2.2 腐蝕

為了評估有關的腐蝕危險，通常要考慮以下信息：

－ 液貨艙和處所的使用

－ 塗層狀況

－ 陽極狀況

－ 清洗程序

－ 先前的腐蝕破損

－ 貨艙壓載的使用和時間

— 腐蝕危險計劃（見參考材料 2，表 3.1）

— 加熱艙的位置。

參考材料 2 通過使用典型狀況圖片，給出了可用於判定和描述塗層狀況的明確範例。

腐蝕危險評估應以參考材料 2 中的信息與船齡和從為準備檢驗方案而收集的信息中取得的有關船舶狀況預測的信息為基礎。

應將各種液貨艙和處所應與相應指定的腐蝕危險一併列出。

3.2.3 確定細節檢驗和厚度測量的位置

在腐蝕危險和設計經驗評估表的基礎上，可以指定初次細節檢驗和厚度測量（部分）的位置。

須進行厚度測量的部分通常應指定在腐蝕危險判定為最高的液貨艙和處所。

對需進行細節檢驗的液貨艙和處所的指定，最初應以最高腐蝕危險為基礎，並應始終包括壓載艙。選擇的原則應為：船齡越大範圍越大，或者，信息不充分或不可靠的地方範圍增加。

參考材料

1 油輪結構合作論壇：《油輪結構檢驗和狀況評估指導手冊，1986》；

2 油輪結構合作論壇：《油輪結構狀況評估和維護，1992》。

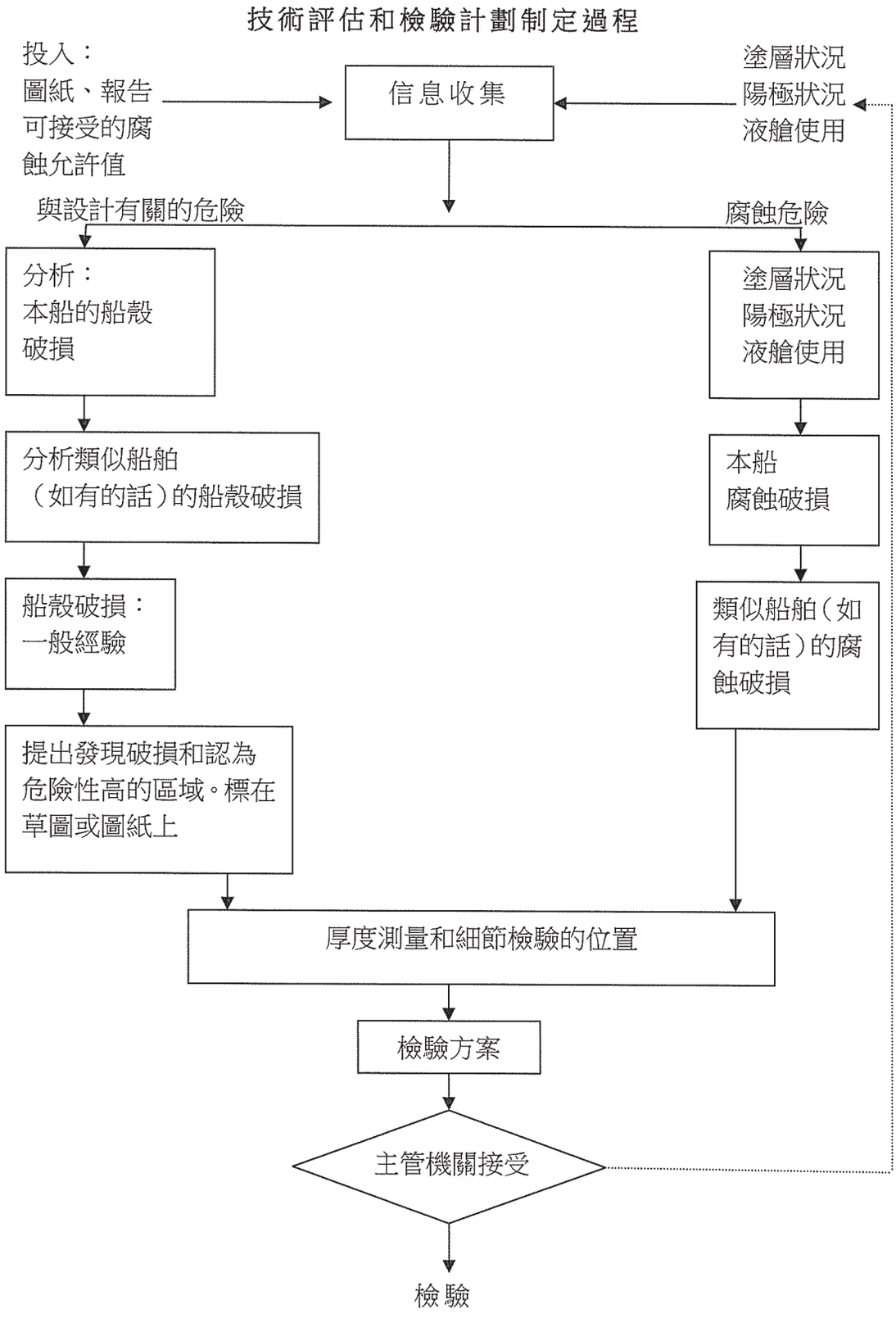
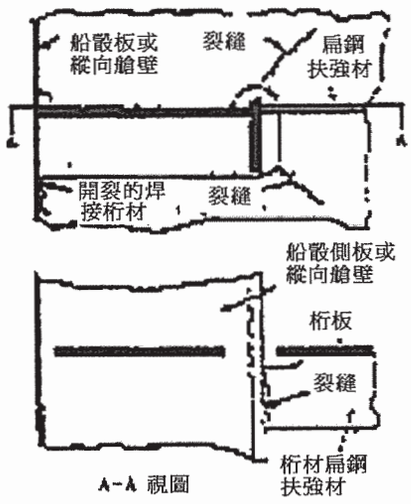


圖 1：計劃制定過程－技術評估和檢驗

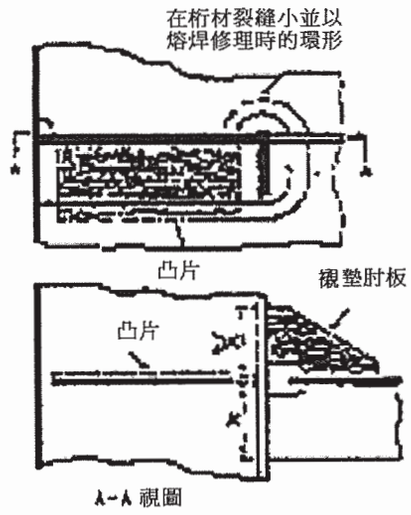
位置： 縱樑與橫桁材的連接

例 1： 縱向扶強材連接切口處桁材和扁鋼裂縫

典型破損	建議的維修



註：可能出現一條或多條裂縫



經剪切並部分更新或代
之以焊接桁材和扁鋼

造成破損的因素

1 扁鋼扶強材的非對稱連接造成的扶強材底緣在疲勞負載下出現的高峰值應力。

2 縱樑與桁材板的連接面積不夠。

3 板的厚度周圍的繞焊有缺陷。

4 應力集中區域的高度局部腐蝕，如扁鋼扶強材板連接處、縱樑切口角和切口處桁材至船殼的連接處。

5 橫向桁材的高剪切應力。

6 動態航行負載/船舶運動。

圖	油輪結構合作論壇	圖
1	內容：構造細節分類	1

圖 2：典型破損和維修舉例（引自參考材料 1）

RESOLUTION MSC.49(66)
(adopted on 4 June 1996)

ADOPTION OF AMENDMENTS TO THE GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS (RESOLUTION A.744(18))

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.744(18) by which the Assembly adopted Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers,

RECALLING FURTHER article VIII(b) and regulation XI/2 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, concerning the procedure for amending the aforementioned Guidelines,

NOTING that the Assembly, at its eighteenth session, when adopting resolution A.744(18), requested the Maritime Safety Committee and the Marine Environment Protection Committee to keep the Guidelines under review and update them as necessary, in the light of experience gained in their application,

HAVING CONSIDERED, at its sixty-sixth session, amendments to the Guidelines proposed and circulated in accordance with article VIII(b)(i) of the SOLAS Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the SOLAS Convention, amendments to the Guidelines the text of which is set out in the Annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 January 1998, unless, prior to that date, more than one third of the Contracting Governments to the SOLAS Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the SOLAS Convention, the amendments shall enter into force on 1 July 1998 upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the SOLAS Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the SOLAS Convention;

5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the SOLAS Convention.

ANNEX

AMENDMENTS TO THE GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS (RESOLUTION A.744(18))

GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS (resolution A.744(18), Annex A)

1 In the contents, "5.1 Planning" is replaced by "5.1 Survey programme"

2 In the contents, the following text is added at the end:

"Annex 9 - Guidelines for technical assessment in conjunction with the planning of enhanced surveys for bulk carriers".

3 In paragraph 5.1, sub-heading "Planning" is replaced by "Survey programme".

4 The following sentence is added to paragraph 5.1.1:

"The survey programme should be in a written format."

5 Existing paragraph 5.1.2 is replaced by the following text:

"5.1.2 In developing the survey programme, the following documentation should be collected and consulted with a view to selecting tanks, holds, areas and structural elements to be examined:

- survey status and basic ship information;
- documentation on board, as described in 6.2 and 6.3;
- main structural plans (scantlings drawings), including information regarding use of high tensile steels (HTS);
- relevant previous survey and inspection reports from both the classification society and the owner;
- information regarding the use of the ship's holds and tanks, typical cargoes and other relevant data;
- information regarding corrosion protection level on the new building; and
- information regarding the relevant maintenance level during operation."

6 Existing paragraph 5.1.3 is renumbered as a new paragraph 5.1.4.

7 Existing paragraph 5.1.4 is deleted.

8 The following new paragraph 5.1.3 is added:

"5.1.3 The submitted survey programme is to account for and comply, as a minimum, with the requirements of annexes 1 and 2 and paragraph 2.7 for close-up survey, thickness measurement and tank testing, respectively, and is to include relevant information including at least:

- basic ship information and particulars;
- main structural plans (scantling drawings), including information regarding use of high tensile steels (HTS);
- plan of holds and tanks;
- list of holds and tanks with information on use, protection and condition of coating;
- conditions for survey (e.g., information regarding tank cleaning, gas freeing, ventilation, lighting, etc.);
- provisions and methods for access to structures;
- equipment for surveys;
- nomination of holds and tanks and areas for close-up survey (per annex 1);
- nomination of sections for thickness measurement (per annex 2);
- nomination of tanks for tank testing (per paragraph 2.7); and
- damage experience related to the ship in question."

9 The following new paragraphs 5.1.5 and 5.1.6 are added:

"5.1.5 The Administration will advise the owner of the maximum acceptable structural corrosion diminution levels applicable to the ship.

5.1.6 Use may also be made of the Guidelines for technical assessment in conjunction with the planning of enhanced surveys for bulk carriers, contained in annex 9. These guidelines are a recommended tool which may be invoked at the discretion of the Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme."

10 The following new annex 9 is added:

"ANNEX 9

GUIDELINES FOR TECHNICAL ASSESSMENT IN CONJUNCTION WITH THE PLANNING OF ENHANCED SURVEYS FOR BULK CARRIERS

PERIODICAL SURVEY

1 INTRODUCTION

These guidelines contain information and suggestions concerning technical assessments which may be of use in conjunction with the planning of enhanced special surveys of bulk carriers. As indicated in paragraph 5.1.6 of Annex A, the guidelines are a recommended tool which may be invoked at the discretion of an Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme.

2 PURPOSE AND PRINCIPLES

2.1 Purpose

The purpose of the technical assessments described in these guidelines is to assist in identifying critical structural areas, nominating suspect areas and in focusing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage. This information may be useful in nominating locations, areas, holds and tanks for thickness measurement, close-up survey and tank testing.

2.2 Minimum requirements

These guidelines may not be used to reduce the requirements of annexes 1 and 2 and paragraph 2.7 of Annex A for close-up survey, thickness measurement and tank testing, respectively, which are, in all cases, to be complied with as a minimum.

2.3 Timing

As with other aspects of survey planning, the technical assessments described in these guidelines should be completed out by the owner or operator in co-operation with the Administration well in advance of the commencement of the periodical survey, i.e. prior to commencing the survey and normally at least 12 to 15 months before the survey's completion due date.

2.4 Aspects to be considered

Technical assessments, which may include quantitative or qualitative evaluation of relative risks of possible deterioration, of the following aspects of a particular ship may be used as a basis for the nomination of holds, tanks and areas for survey:

- design features such as stress levels on various structural elements, design details and extent of use of high tensile steel;

- former history with respect to corrosion, cracking, buckling, indents and repairs for the particular ship as well as similar vessels, where available; and

- information with respect to types of cargo carried, protection of tanks, and condition of coating, if any, of holds and tanks.

Technical assessments of the relative risks of susceptibility to damage or deterioration of various structural elements and areas should be judged and decided on the basis of recognized principles and practices, such as may be found in reference 3.

3 TECHNICAL ASSESSMENT

3.1 General

There are three basic types of possible failure which may be the subject of technical assessment in connection with planning of surveys; corrosion, cracks and buckling. Contact damages are not normally covered by the survey plan since indents are usually noted in memoranda and assumed to be dealt with as a normal routine by surveyors.

Technical assessments performed in conjunction with the survey planning process should, in principle, be as shown schematically in figure 1 which depicts, schematically, how technical assessments can be carried out in conjunction with the survey planning process. The approach is based on an evaluation of experience and knowledge basically related to.

.1 design; and

.2 corrosion.

The design should be considered with respect to structural details which may be susceptible to buckling or cracking as a result of vibration, high stress levels or fatigue.

Corrosion is related to the ageing process, and is closely connected with the quality of corrosion protection at newbuilding, and subsequent maintenance during the service life. Corrosion may also lead to cracking and/or buckling.

3.2 Methods

3.2.1 Design details

Damage experience related to the ship in question and similar ships, where available, is the main source of information to be used in the process of planning. In addition, a selection of structural details from the design drawings should be included.

Typical damage experience to be considered will consist of:

- number, extent, location and frequency of cracks; and
- location of buckles.

This information may be found in the survey reports and/or the owner's files, including the results of the owner's own inspections. The defects should be analysed, noted and marked on sketches.

In addition, general experience should be utilized. For example, figure 2 shows typical locations in bulk carriers which experience has shown may be susceptible to structural damage. Also, reference should be made to reference 3 which contains a catalogue of typical damages and proposed repair methods for various bulk carrier structural details.

Such figures should be used together with a review of the main drawings, in order to compare with the actual structure and search for similar details which may be susceptible to damage. An example is shown in figure 3.

The review of the main structural drawings, in addition to using the above-mentioned figures, should include checking typical design details where cracking has been experienced. The factors contributing to damage should be carefully considered.

The use of high tensile steel (HTS) is an important factor. Details showing good service experience where ordinary, mild steel has been used may be more susceptible to damage when HTS, and its higher associated stresses, are utilized. There is extensive and, in general, good experience, with the use of HTS for longitudinal material in deck and bottom structures. Experience in other locations, where the dynamic stresses may be higher, is less favourable, e.g. side structures.

In this respect, stress calculations of typical and important components and details, in accordance with relevant methods, may prove useful and should be considered.

The selected areas of the structure identified during this process should be recorded and marked on the structural drawings to be included in the survey programme.

3.2.2 Corrosion

In order to evaluate relative corrosion risks, the following information is generally to be considered:

- usage of tanks, holds and spaces
- condition of coatings
- condition of anodes
- cleaning procedures
- previous corrosion damage
- ballast use and time for cargo holds
- risk of corrosion in cargo holds and ballast tanks
- location of ballast tanks adjacent to heated fuel oil tanks.

Reference 2 gives definitive examples which can be used for judging and describing coating condition, using typical pictures of conditions.

For bulk carriers, reference 3 should be used as the basis for the evaluation, together with the age of the ship and relevant information on the anticipated condition of the ship as derived from the information collected in order to prepare the survey programme.

The various tanks, holds and spaces should be listed with the corrosion risks nominated accordingly.

3.2.3 Locations for close-up survey and thickness measurement

On the basis of the table of corrosion risks and the evaluation of design experience, the locations for initial close-up survey and thickness measurement (sections) may be nominated.

The sections subject to thickness measurement should normally be nominated in tanks, holds and spaces where corrosion risk is judged to be the highest.

The nomination of tanks, holds and spaces for close-up survey should, initially, be based on highest corrosion risk, and should always include ballast tanks. The principle for the selection should be that the extent is increased by age or where information is insufficient or unreliable.

REFERENCES

1 TSCF "Guidance Manual for the Inspection and Condition Assessment of Tanker Structures, 1986."

2 TSCF "Condition Evaluation and Maintenance of Tanker Structures, 1992."

3 IACS "Bulk Carriers: Guidelines for Surveys, Assessment and Repair of Hull Structures,1994."

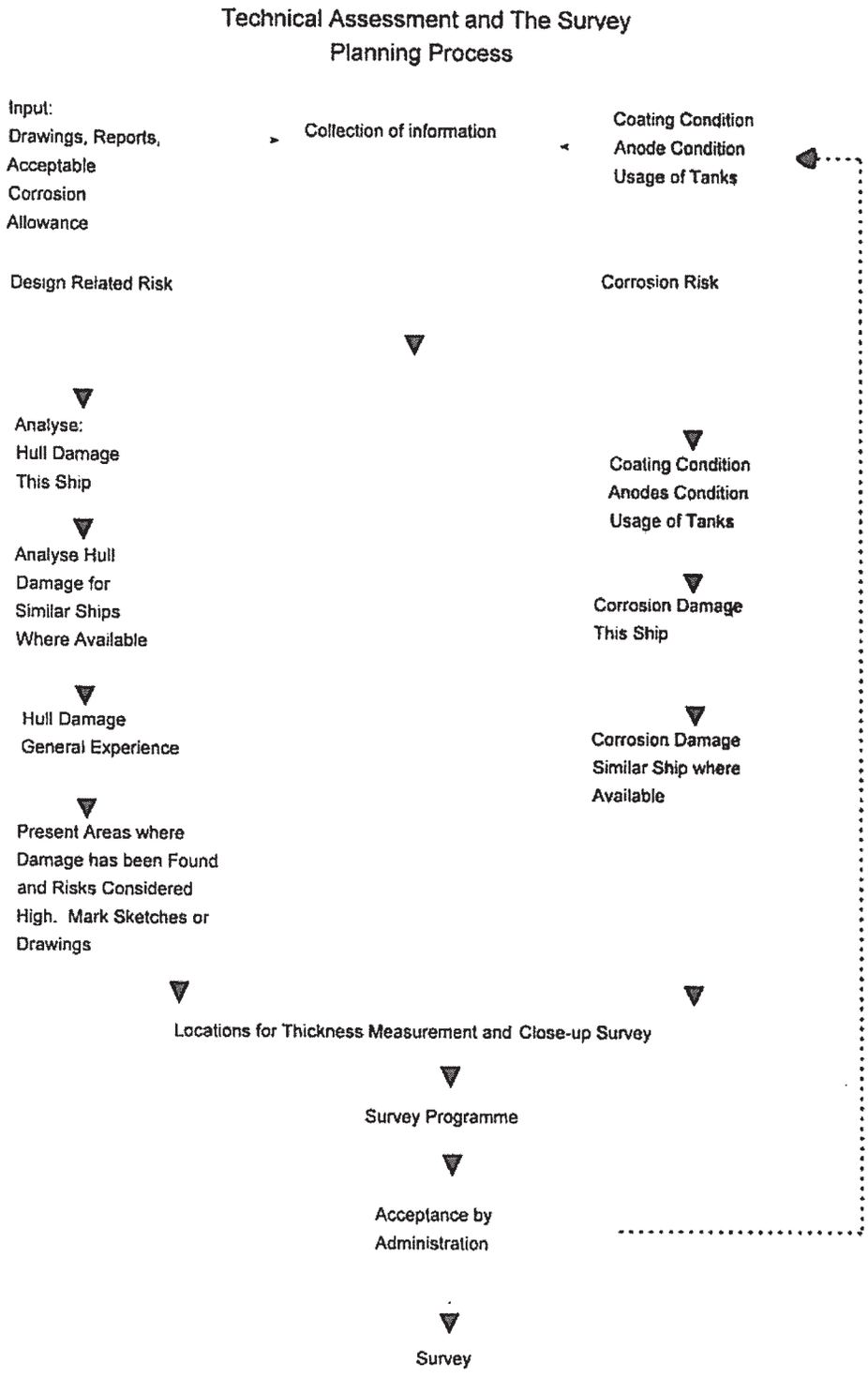


Figure 1: Planning Process
Technical Assessment and The Survey

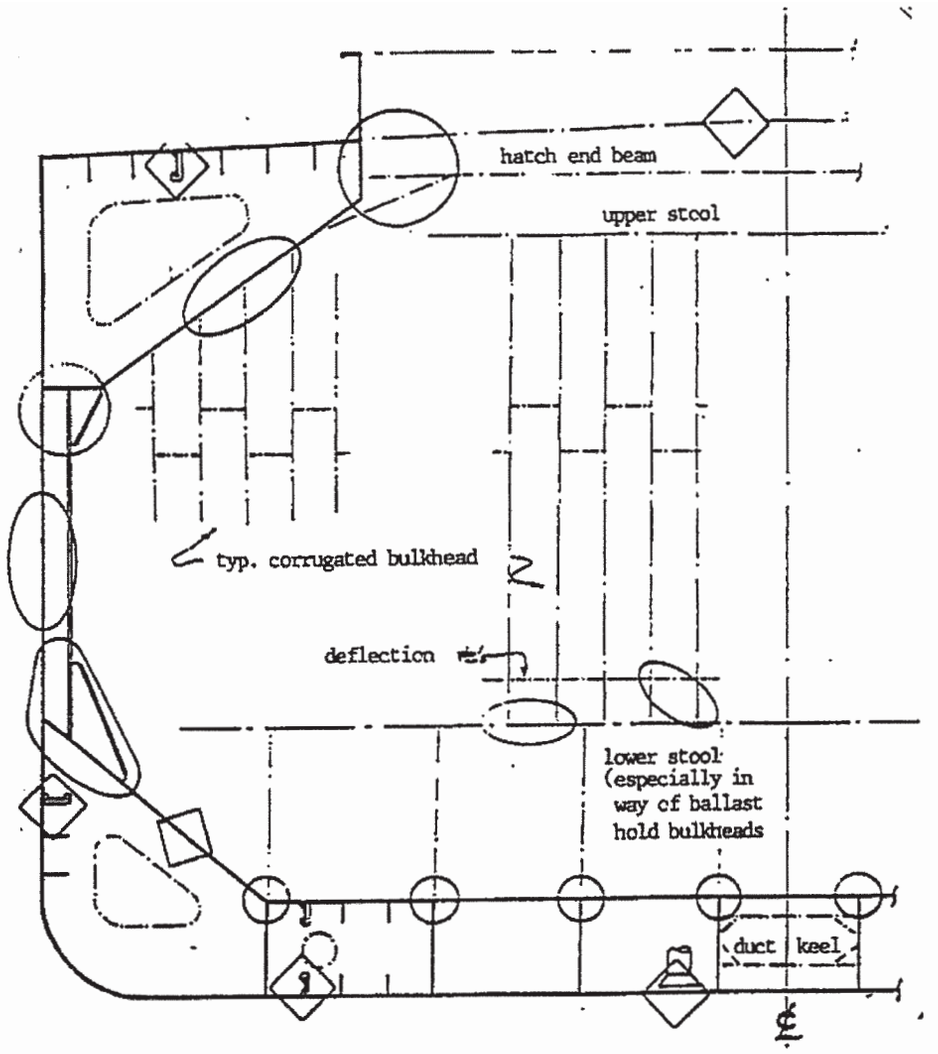
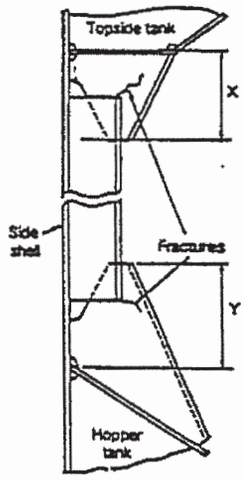


Figure 2: Typical locations susceptible to structural damage or corrosion

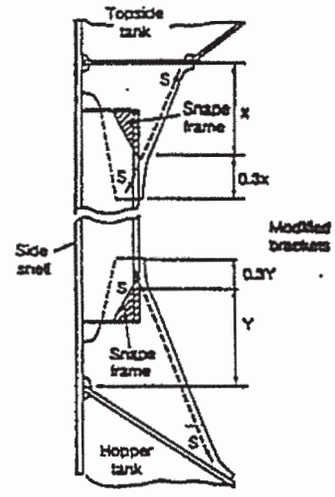
AREA 1	Structural item	Side shell frames and end brackets (Separate bracket configuration)	EXAMPLE 1
Detail of damage		Fractures on brackets at termination of frame	

Sketch of damage



Separate Bracket Configuration

Sketch of repair



S = Snaped end

Notes on possible cause of damage/repair

1	This type of damage is due to stress concentration.
2	For small fractures, e.g. hairline fractures, the fracture can be 'veed' out, welded up, ground and examined by NDT for fractures
3	For larger/significant fractures consideration is to be given to cropping and partly renewing/renewing the frame brackets. If renewing the brackets, ends of frames can be shaped to soften them.
4	If felt prudent, soft toes are to be incorporated at the boundaries of the bracket to the wing tanks.
5	Attention to be given to the structure in wing tanks in way of the extended bracket arm i.e. reinforcement provided in line with the bracket arm.

Figure 3: Typical damage and repair example
(reproduced from ref.3)."

GUIDELINES ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF OIL TANKERS (resolution A.744(18), annex B)

11 In the contents, "5.1 Planning" is replaced by "5.1 Survey programme."

12 In the contents, the following text is added at the end:

"Annex 11 - Guidelines for technical assessment in conjunction with the planning of enhanced surveys for oil tankers".

13 In paragraph 5.1, sub-heading "Planning" is replaced by "Survey programme".

14 The following sentence is added to paragraph 5.1.1:

"The survey programme should be in a written format "

15 Existing paragraph 5.1.2 is replaced by the following text:

"5.1.2 In developing the survey programme, the following documentation should be collected and consulted with a view to selecting tanks, areas, and structural elements to be examined:

- survey status and basic ship information;
- documentation on board, as described in 6.2 and 6.3;
- main structural plans (scantlings drawings), including information regarding use of high tensile steels (HTS);
- relevant previous survey and inspection reports from both the classification society and the owner;
- information regarding the use of the ship's tanks, typical cargoes and other relevant data;
- information regarding corrosion protection level on the new building; and
- information regarding the relevant maintenance level during operation."

16 Existing paragraph 5.1.3 is renumbered as a new paragraph 5.1.4.

17 Existing paragraph 5.1.4 is deleted.

18 The following new paragraph 5.1.3 is added.

"5.1.3 The submitted survey programme is to account for and comply, as a minimum, with the requirements of annexes 1, 2 and 3 for close-up survey, thickness measurement and tank testing, respectively, and is to include relevant information including at least:

- basic ship information and particulars;
- main structural plans (scantling drawings), including information regarding use of high tensile steels (HTS);

- plan of tanks;
- list of tanks with information on use, protection and condition of coating;
- conditions for survey (e.g., information regarding tank cleaning, gas freeing, ventilation, lighting, etc.);
- provisions and methods for access to structures;
- equipment for surveys;
- nomination of tanks and areas for close-up survey (per annex 1);
- nomination of sections for thickness measurement (per annex 2);
- nomination of tanks for tank testing (per annex 3); and
- damage experience related to the ship in question."

19 The following new paragraphs 5.1.5 and 5.1.6 are added:

"5.1.5 The Administration will advise the owner of the maximum acceptable structural corrosion diminution levels applicable to the ship.

5.1.6 Use may also be made of the Guidelines for technical assessment in conjunction with the planning of enhanced surveys for tankers, contained in annex 11. These guidelines are a recommended tool which may be invoked at the discretion of the Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme."

20 The following new annex 11 is added:

"ANNEX 11

GUIDELINES FOR TECHNICAL ASSESSMENT IN CONJUNCTION WITH THE PLANNING OF ENHANCED SURVEYS FOR OIL TANKERS

PERIODICAL SURVEY

1 INTRODUCTION

These guidelines contain information and suggestions concerning technical assessments which may be of use in conjunction with the planning of enhanced special surveys of oil tankers. As indicated in paragraph 5.1.6 of Annex B, the guidelines are a recommended tool which may be invoked at the discretion of an Administration, when considered necessary and appropriate, in conjunction with the preparation of the required survey programme.

2 PURPOSE AND PRINCIPLES

2.1 Purpose

The purpose of the technical assessments described in these guidelines is to assist in identifying critical structural areas, nominating suspect areas and in focusing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage. This information may be useful in nominating locations, areas and tanks for thickness measurement, close-up survey and tank testing.

2.2 Minimum requirements

These guidelines may not be used to reduce the requirements of annexes 1, 2 and 3 for close-up survey, thickness measurement and tank testing, respectively, which are, in all cases, to be complied with as a minimum.

2.3 Timing

As with other aspects of survey planning, the technical assessments described in these guidelines should be completed out by the owner or operator in co-operation with the Administration well in advance of the commencement of the periodical survey, i.e., prior to commencing the survey and normally at least 12 to 15 months before the survey's completion due date.

2.4 Aspects to be considered

Technical assessments, which may include quantitative or qualitative evaluation of relative risks of possible deterioration, of the following aspects of a particular ship may be used as a basis for the nomination of tanks and areas for survey:

- design features such as stress levels on various structural elements, design details and extent of use of high tensile steel;

- former history with respect to corrosion, cracking, buckling, indents and repairs for the particular ship as well as similar vessels, where available; and

- information with respect to types of cargo carried, use of different tanks for cargo/ballast, protection of tanks and condition of coating, if any.

Technical assessments of the relative risks of susceptibility to damage or deterioration of various structural elements and areas should be judged and decided on the basis of recognized principles and practices, such as may be found in references 1 and 2.

3 TECHNICAL ASSESSMENT

3.1 General

There are three basic types of possible failure which may be the subject of technical assessment in connection with planning of surveys; corrosion, cracks and buckling. Contact damages are not normally covered by the survey plan since indents are usually noted in memoranda and assumed to be dealt with as a normal routine by surveyors.

Technical assessments performed in conjunction with the survey planning process should, in principle be as shown schematically in figure 1 which depicts, schematically, how technical assessments can be carried out in conjunction with the survey planning process. The approach is based on an evaluation of experience and knowledge basically related to:

.1 design; and

.2 corrosion.

The design should be considered with respect to structural details which may be susceptible to buckling or cracking as a result of vibration, high stress levels or fatigue.

Corrosion is related to the ageing process, and is closely connected with the quality of corrosion protection at newbuilding, and subsequent maintenance during the service life. Corrosion may also lead to cracking and/or buckling.

3.2 Methods

3.2.1 Design details

Damage experience related to the ship in question and similar ships, where available, is the main source of information to be used in the process of planning. In addition, a selection of structural details from the design drawings should be included.

Typical damage experience to be considered will consist of:

- number, extent, location and frequency of cracks; and

- location of buckles.

This information may be found in the survey reports and/or the owner's files, including the results of the owner's own inspections. The defects should be analysed, noted and marked on sketches.

In addition, general experience should be utilized. For example, reference should be made to reference 1, which contains a catalogue of typical damages and proposed repair methods for various tanker structural details.

Such figures should be used together with a review of the main drawings, in order to compare with the actual structure and search for similar details which may be susceptible to damage. An example is shown in figure 2.
The review of the main structural drawings, in addition to using the above-mentioned figures, should include checking for typical design details where cracking has been experienced. The factors contributing to damage should be carefully considered.

The use of high tensile steel (HTS) is an important factor. Details showing good service experience where ordinary, mild steel has been used may be more susceptible to damage when HTS, and its higher associated stresses, are utilized. There is extensive and, in general, good experience, with the use of HTS for longitudinal material in deck and bottom structures. Experience in other locations, where the dynamic stresses may be higher, is less favourable, e.g. side structures.

In this respect, stress calculations of typical and important components and details, in accordance with relevant methods, may prove useful and should be considered.

The selected areas of the structure identified during this process should be recorded and marked on the structural drawings to be included in the survey programme.

3.2.2 Corrosion

In order to evaluate relative corrosion risks, the following information is generally to be considered:

- usage of tanks and spaces
- condition of coatings
- condition of anodes
- cleaning procedures
- previous corrosion damage
- ballast use and time for cargo tanks
- corrosion risk scheme (see reference 2, table 3.1)
- location of heated tanks.

Reference 2 gives definitive examples which can be used for judging and describing coating condition, using typical pictures of conditions.

The evaluation of corrosion risks should be based on information in reference 2, together with the age of the ship and relevant information on the anticipated condition as derived from the information collected in order to prepare the survey programme.

The various tanks and spaces should be listed with the corrosion risks nominated accordingly.

3.2.3 Locations for close-up survey and thickness measurement

On the basis of the table of corrosion risks and the evaluation of design experience, the locations for initial close-up survey and thickness measurement (sections) may be nominated.

The sections subject to thickness measurement should normally be nominated in tanks and spaces where corrosion risk is judged to be the highest.

The nomination of tanks and spaces for close-up survey should, initially, be based on highest corrosion risk, and should always include ballast tanks. The principle for the selection should be that the extent is increased by age or where information is insufficient or unreliable.

REFERENCES

1. TSCF "Guidance Manual for the Inspection and Condition Assessment of Tanker Structures, 1986."

2. TSCF "Condition Evaluation and Maintenance of Tanker Structures, 1992."

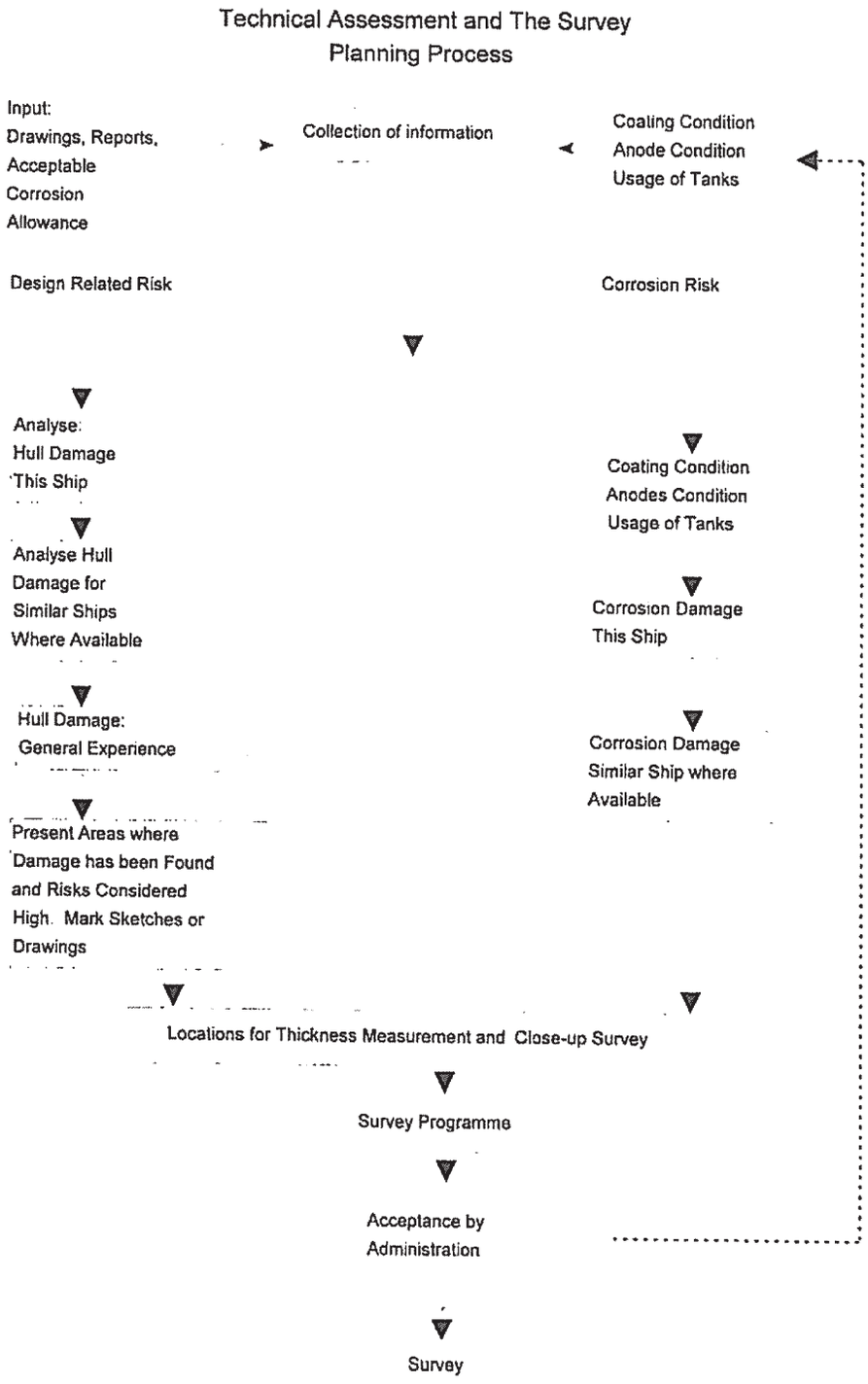
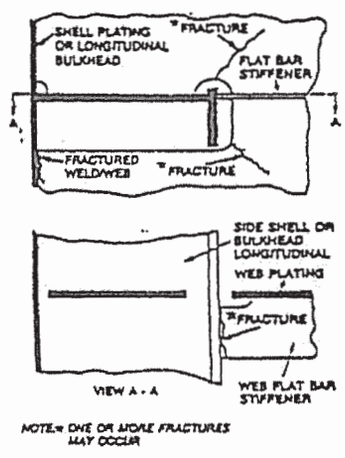
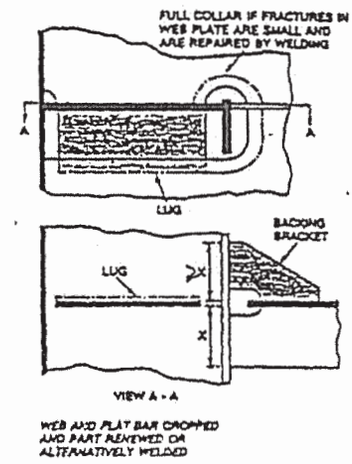


Figure 1: Planning Process
Technical Assessment and The Survey

LOCATION: Connection of longitudinals to transverse webs

EXAMPLE NO.1 Web and flat bar fractures at cut-outs for longitudinal stiffener connections

TYPICAL DAMAGE	PROPOSED REPAIR
	

FACTORS CONTRIBUTING TO DAMAGE

1 Asymmetrical connection of flat bar stiffener resulting in high peak stresses at the heel of the stiffener under fatigue loading.

2 Insufficient area of connection of longitudinal to web plate.

3 Defective weld at return around the plate thickness.

4 High localized corrosion at areas of stress concentration such as flat bar stiffener connections, corners of cut-out for the longitudinal and connection of web to shell at cut-outs.

5 High shear stress in the web of the transverse.

6 Dynamic sea way loads/ship motions.

FIGURE 1	TANKER STRUCTURE CO-OPERATIVE FORUM	FIGURE 1
	SUBJECT: CATALOGUE OF STRUCTURAL DETAILS	

Figure 2: Typical damage and repair example
(reproduced from ref.1)".