24-7-85/MAP

PROJECTS RELATING TO MARINE SAFETY

Notes by MAP on Jobs done by Technica, or Technica personnel, that have a marine content.

A) Jobs done before Technica was Founded.

Whilst at Cremer and Warner, quite alot of marine relating risk work was done by DHS,MAS,RAC,MAP,PJC,CGR,PEL,RJW. In general these jobs were risk assessments of LNG or LPG inport/export terminals where the job was both hazard analysis of the onshore facilities and an analysis of the frequency and consequence of ship collision with gas carriers. I have listed the principal jobs below, as I remember them, together with the initails of the person or people who could provide most information about that job if necessary.

1. Wilhelmshaven Terminal, West Germany (DHS,PJC)
2. Zeebrugge Terminal (DHS)
3. Eemshaven LNG Terminal, Holland (MAS)
4. Western Austrailia LNG Terminal (RAC)
5. Dublin Harbour: LPG (DHS,CGR)
6. Flotta, Orkneys: LPG (CGR)
7. Orka Voe, Shetlands: LPG (CGR)
8. Nigg Bay, Scotland: Oil, LPG (CGR)
9. Reliability of Dynamic positioning for Diving Vessels (RJW)

There were probably several other marine jobs, but either I have forgotten them, or they were before my time at C+W. If you need to be able to quote more experience ask any of the above.

B) MARINE WORK AT TECHINCA - NOT DIRECTLY CONNECTED TO OFFSHORE PLATFORMS

103. **Olasco** Consequence analysis of an oil tanker converted to process LNG. The tanker was connected by a gas line to the sea bed via a floating loading bouy. It processed the LNG and then transferred it to a shuttle tanker using a semi-pressurized "Ocean Phoenix" design of tank. This study was done as a joint venture with Lloyds. (DHS)

117. **Shetland Islands Oil Spill Risk.** This was an analysis of the risks of oil spilage from tankers passing round the Shetlands on route to Sullom Voe. Commissioned by the Shetland Islands council its purpose was to decide whether or not an ocean going oil fighting tug should be permanantly on standby. The project was done jointly with Peter Lyon of ELP. (MAS)

120. **British Gas Canvey Enquiry.** Besides reviewing British Gas's work and preparing proofs of evidence for the Canvey enquiry Technica did detailed reviews of the SRD'S analysis of the marine risks at Canvey. It came out concluding that the risks should be equal to or higher than the SRD figures. The study goes into a lot of detail relating to SRD'S methodology and data. (DHS/RAC)

322. **HSE Felixstowe** - an analysis of the risks of collision for LPG carriers docking at Felixstowe. (DHS/NCH).

C. MARINE STUDIES RELATING TO OFFSHORE: EXCLUDING LIFEBOAT WORK.

111. **Department of Energy review of offshore risks.** This was an update of a previous study done by Cremer and Warner and which subsequently turned into the Risk Overview. (PJC/DHS)

115 **Heimdal Safety Evaluation Elf Aquitaine Norge.** This was the first CSE. It looked at passing and supply vessel collision risk. More particularly, two additional studies were carried out on the prospects for offshore loading. One by a concrete monotower, the other by a choice of articulated spar buoy. Both studies are separate reports under the global job number 115. TG was the client for these, and they were done by DHS/MAP/RAC.

138 **Department of Energy Collision Risk.** This was the beginning of all the collision risks stuff, starting with Phase 1. (DHS).

142 **ICI Risk Overview Offshore.** This was a broad brush concept study of a tension leg platform to be situated off West Coast California. It went into some detail on marine risks including risks from towing from the yard in Japan to the site. (DHS)

151 **BP ULA Safety Study.** We did two bits of work to contribute to BP's safety study on ULA. One relating to the risers, the other relating to collisions from the offshore loading tanker. (DHS)

156 **Statpipe 16/11S and 2/4S Safety Studies.** This was Technica's second concept safety evaluation and included passing vessel and supply vessel collision risk. It did not go into more detail than was previously done at Heimdal.

160 **Department of Energy Collision Risk Phase III.**

162 **Gullfaks B Safety Evaluation.** This was the first study on Gullfaks B. Again it covered passing vessel and supply vessel collision risk and this time went into quite a lot of detail on collision impacts with concrete and steel structure. This work was actually done by Rendall Palmer Tritton (John Dawson). (PC/BM)

164 **Review of TCP2 study Elf.** This was a very detailed review of a DNV risk analysis of Elf's TCP2 platform. One of the DNV volumes related to collision risk and this was reviewed by us. Since the study was done by MAP for TG, TG is probably the best placed to know about it!

167 **Review of Flotel collision risk study for NIFO.** This was another detailed review of a DNV study, except in this case it went into more detail than the original study itself. It contains a great deal of operator data on anchor chain breakages and other flotel mishaps (we have written permission from NIFO to use this data anonymously to help DOE). Note there are three volumes to the report, the third giving the confidential results for each of four operators. There is considerable backup data for this report in two of the blue folders in the brown cupboard in the library. The study was done by MAP and MC and TG was on the steering committee. TG is therefore probably the best person to ask any questions on this job.

169 **Gullfaks A Total Risk Analysis.** This tour de force contains a large section on risks from the articulated loading platform and associated collision risks. (RAC)

176 **Gullfaks B Safety Study: concrete version.** This study contains a lot of the collision impact work of supply vessels with offshore concrete structures. It was later superceded by the Gullfaks B Total Risk Analysis. (PC/BM)

184 **Statfjord Loading Platform Risk Analysis.** This was a detailed confidential study of the risks at the loading platform to tanker interface for Statfjord A. It comes up with very high risk estimates for the bow tanker personnel. Done by MAP and CJW for Statoil SVK Department. Contains good operator data on telemetry failures and hose failures. Some of this work was used in the Gullfaks A TRA. The work was done by MAP, PEL, CJW.

192 **Statpipe Total Risk Analysis.** This was a joint venture with Scanpower and include marine threats to the Statpipe system.

206 **Norsk Hydro Review of DNV collision study for Oseberg.** Another peer review, this time of DNV's collision risk model as applied to the Oseberg field. Done by MAP only, so for any questions refer to the text.

212 **Phillips Waterflood Platform Safety Study.** Contains supply vessel and passing vessel collision risk estimates for the relevant to the Ekofisk field. These were discussed at some length with PPCon (CGR).

221 **Gullfaks B Safety Study.** Yet another version of this!

240 **Flotel study for Elf Aquitaine.** This was a very very small piece of work done by MAP for TG, looking at data on flotels used at Frigg Field. TG will remember it.

244 **Sleipner Safety Study.** This includes collision risk work. (PC/GJW)

257 **Semi-submersible risk analysis for Norsk Hydro.** Safety evaluation of an arctic drilling rig. Done principally by Jan Erik Vinnem; MAS was project manager.

265 **Askeladden.** Another safety evaluation, including passing and supply vessel collision risk for arctic areas figures. I cannot remember whether or not includes iceberg risk. (DHS?)

266 **Subsea Pipeline Study for NAM.** I think this contains some data on risk of damage from anchor lines. (MAS)

339 **Department of Energy Traffic Surveys.** (DVN/PRL)

376 **BP Sullom Voe Risks.** (CGR)

424 **Statoil Gullfaks B Total Risk Analysis.** (PC)

D. OFFSHORE, RELATING TO LIFEBOATS AND EVACUATION

158 **Department of Energy: The Yellow Book Study.** This was done principally by MAP and DHS with the marine wave analysis being done by National Maritime Institute.

220 **Statpipe Project Reliability of Freefall Lifeboats.** A detailed fault tree study of the original type of skid mounted freefall boat as exists at Trondheim. (RAC)

227 **Department of Energy Lifeboats:** a follow on to 158.

229 **Study on Evacuation for Merchant Vessels.** This was a literature study, principally from Lloyds, but also from a number of other sources. Managed by MAP the Lloyd's literature search was done by David Shirley, and the other sources by Peter Lyon.

232? Same study as 229 but applied to fishing vessels. Done by MAP/PRL. This work and the work covered in 229 has now been published in a paper for RINA by MAP/PRL.

252 **Lifeboat Study for Mobil.** This was a run through on their results for their Beryl platforms. Done principally by MAP.

258 **Department of Energy Fishing Vessel Risk.** I put this down as 232 above: there was confusion over the job numbers for this project.

276 **Lifeboat Study for BP.** An analysis of siting of lifeboats for one of BP's southern sector platforms. Done by CGR.

277 **Department of Energy Freefall Lifeboats.** This was the main freefall study, covering both skid mounted and vertical drop freefall boats. Done by MAP and OB in Norway.

278 **Department of Energy Liferafts.** This was the application of the escape model to throwover and davit launched liferafts. The project was passed around several people, initially JEV, then CGR, then finished off by MAP and DMB. CGR is probably in the best position to provide general info, and DMB on the specifics. CdR was involved in running the escape model at the end of that project.

279 **Department of Energy Attendant Vessels.** This project was originally intended to fill in some of the gaps at the end of escape on performance of attendant vessels in picking up lifeboats or people in the water. In fact it went off at a slight tangent. It is now, however, a good source of data on timescales of offshore incidents and it has some excellent literature data on the UK record in picking up man overboard. (DHS)

305 **Lifeboat Study for Total.** Application of escape to Total MCP01 (I think). Done by CGR.

309 **Department of Energy Printing of Yellow Book.** A dummy number to cover the costs of printing.

314 **Lifeboat study for Hydrocarbons Great Britain/Bechtel.** Application of escape to a new platform. Done by DMB.

316 **Analysis of "Lifescape".** This job number was replaced by N112 - see later below.

325 **Foster Wheeler - Lifeboat Study.** Analysis of the location of lifeboats on a new platform. Done by DMB.

327 **Mobil Analysis of Dry Liferaft Evacuation.** A detailed application of escape to the use of launching davit launch liferafts onto the back of standby vessels. Done by CGR.

332 **Department of Energy Study of Escape Sensitivity.** The review of the sensitivity of the escape model to various parameters.

333 **Department of Energy PROD.** Application of escape to the PROD system, assuming the basic mechanics work perfectly. Done by DMB.

366 **Department of Energy Escape Sensitivity 2.** More analysis of sensitivities. This work and 332 and, I think some other bits and pieces, were all combined into a single report on the sensitivity of the escape model. This report has generally died, because of some rather doubtful work that was done on the sensitivity of the model to improvements in training.

377 **Ocean Ranger Commission.** The escape program was applied to the Ocean Ranger disaster. In general, not with much success, and this was part of the original impetus for Technica wanting to go on with Escape 2. Done by DHS/DMB.

334 **Application of escape to Whittaker Capsules.** Currently being done by DVN.

N101 **Accidents scenarios for Phillips at Ekofisk.** Looking at scenarios that would require evacuation by lifeboat. Done by MAP with Tor Ulleberg (who now works for Phillips). DMB is familiar with this.

N107 **Review of Heimdal work for Elf.** This included quite a bit of work on the installation for freefall lifeboats on Heimdal.

N108? **EAN Lifeboats.** As in N107.

N112 **Analysis of the "Lifescape" concept.** A detailed study of how "Lifescape" would perform in escape for typical platforms, done directly for the manufacturer. Work was done by MAP/OB and included a considerable amount of ergonomics for improving the interior design. This was done by using an ergonomics consultants (Anderson, who was living in Oslo). Most of our recommendations have been implemented in the current "Lifescape".

N114 **Phillips Jackup Safety Analysis.** This included some work on evacuation from the Jackup Dyvi Beta. Done by PJC.

N125 **Elf Evacuation and Rescue Analysis.** This was a detailed analysis of the five Frigg Field platforms, both for evacuation and subsequent rescue from the water. It presents new ways of analysing total platform evacuation facilities, and also includes a new rescue model programme not yet used in other projects. The purpose of the project was to evaluate the cost effectiveness of using/not using a standby vessel. (PJC)

E. OTHER BITS AND PIECES

166 **Safety Manager for Statpipe Project.** MAS was safety manager working for Fluor on the Statpipe project for some 18 months. In this position he was involved to a great extent in many issues relating to marine safety - e.g. on construction barges, while diving, etc. etc. etc.

324 **Elf/UK Diving Accidents.** A tiny job done by MAP for TG to provide data on UK diving statistics.