

FORMAL INVESTIGATION INTO THE COMMERCIAL DIVING ACCIDENT ABOARD
THE MOBILE OFFSHORE DRILLING UNIT CLIFF'S DRILLING RIG NO. 12 ON
4 MARCH 1996, WITH LOSS OF LIFE

G&G Marine
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None

Findings of Fact:

Reactivation of Rig 12

1. In February 1996, Cliffs Drilling Co. began to reactivate Rig 12. The MODU had been stacked in Sabine Pass, TX for about eighteen months. Stacking, also called laying up or cold stacking, means that an owner has taken a vessel out of service and moved it to a protected area for storage. When a MODU is stacked, the owner may continue to have the vessel inspected to keep its Certificate of Inspection (COI) active. The owner may instead elect to allow the COI to lapse by not having the vessel inspected. Rig 12's COI had expired on 28 January 1996. On 4 March 1996, Rig 12 was being inspected to reactivate its COI for charter to Hercules Offshore, Inc. (Hercules).²
2. As part of the reactivation, Cliffs requested Coast Guard approval for a special examination in lieu of drydocking (SEILOD).³ In its review of the SEILOD proposal, MSO Port Arthur examined it to determine whether the proposal met the Coast Guard's regulatory requirements and when marine inspectors would be available to conduct the exam. Based on the proposal, MSO Port Arthur granted the request for a SEILOD.⁴
3. Self-elevating units (jack-up rigs) must be examined in accordance with a plan submitted by the owner or operator at least 60 days in advance of the requested inspection date.⁵ The plan must be submitted to Coast Guard Headquarters, G-MOC, for review and approval. However, plan approval authority had been delegated to the Officer in Charge Marine

² , testimony, Vol. 2, pg. 5

³ USCG Investigation, Vol. 4, IO exhibit 33 (Cliffs Drilling Co., Proposal to Conduct Inspection)

⁴ USCG Investigation, Vol. 4, IO exhibit 32 (Letter to _____ from _____ dated February 26, 1996)

⁵ 46 CFR 107.261 - Drydock or Special Examination; 46 CFR 107.267 - Special Examination in Lieu of Drydocking (SEILOD)

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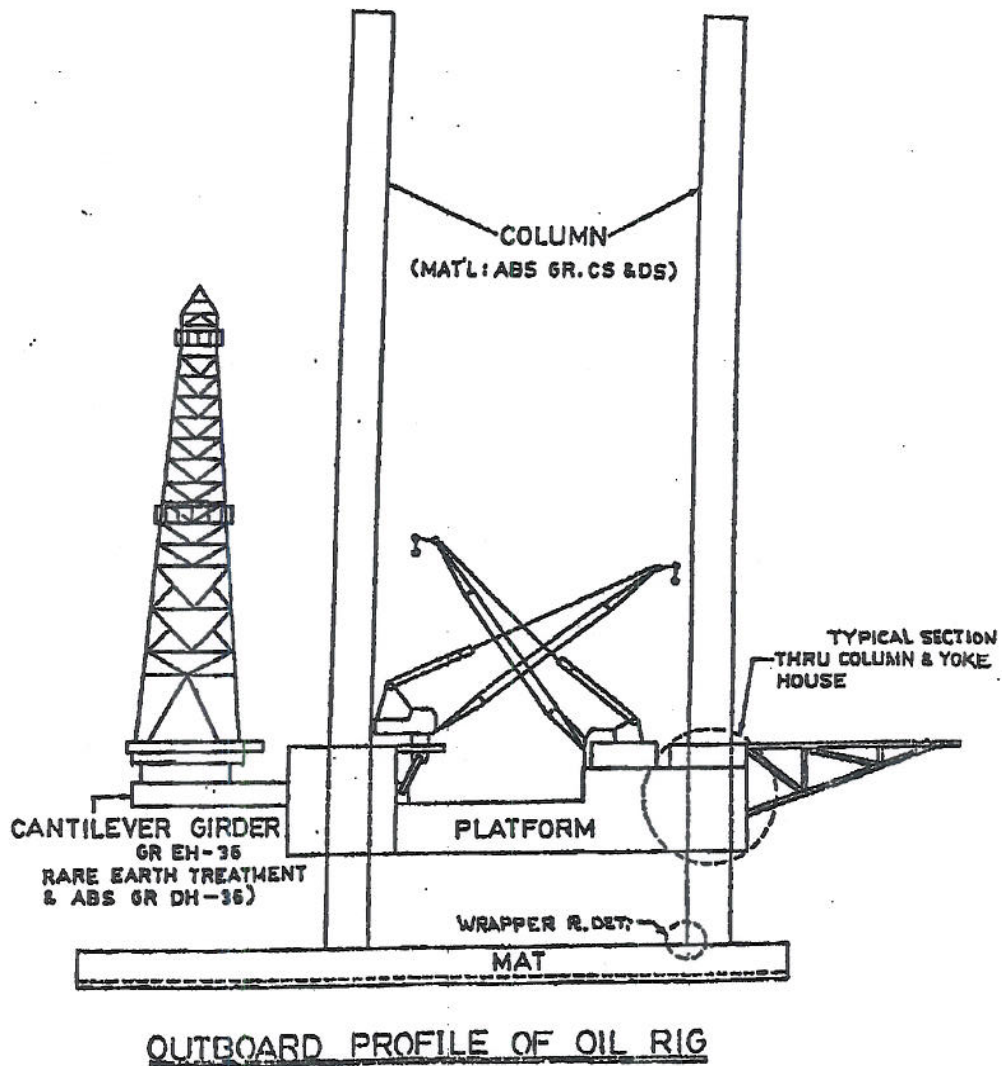


Figure 1: Mobil Offshore Drilling Unit

Inspection (OCMI).⁶ Typically, if all the requirements set out in the regulations are met, the plan is approved. Cliffs' SEILOD proposal addressed all but two of the required items.⁷ The proposal did not specify the inspection location or the name of the diving company to be used. SEILOD proposals often do not contain those two items because diver availability is often not known 60 days in advance and the need to find water clear enough to conduct an underwater inspection may cause the location to change. These items are usually identified

⁶ Marine Safety Manual, Vol. II, Ch. 35.C.16 - Special Underwater Inspection in Lieu of Drydocking

⁷ USCG Investigation, Vol. 4, IO exhibit 33 (Cliffs Drilling Co., Proposal to Conduct Inspection)

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as the inspection date approaches, and the omission of these items is not normally cause to disapprove a proposal. Cliffs' proposal also did not meet the 60-day notice requirement. The short notice was caused by Cliffs' need to reactivate Rig 12 quickly to meet their charter agreement with Hercules. This too is common and would not normally be cause for disapproval.

4. In its application, Cliffs requested a waiver of a liveboating prohibition against diving from one hour after sunset to one hour before sunrise.⁸ The Commandant may grant variances from the regulations, but OCMI's have not been delegated that authority.⁹ Nevertheless, Marine Safety Office Port Arthur waived the sunset to sunrise restriction based on Cliffs' promise to take precautions to ensure diver safety. Cliffs took the promised precautions.¹⁰
5. The Coast Guard conducts SEILODs on MODUs according to Navigation and Vessel Inspection Circular (NVIC) 12-69. The Commandant, Office of Merchant Marine Safety (G-MVI-2) promulgated NVIC 12-69 on 12 December 1969. The SEILOD procedures were established because drydocks were not able to accommodate the large MODUs being built. Rather than exempt MODUs from drydock requirements, G-MVI-2 developed special examination methods not requiring drydocking. NVIC 12-69 imposes no requirements on OCMI's to evaluate divers, diving companies, or diving safety on SEILODs. NVIC 12-69 has not been canceled and remains an effective circular.
6. NVIC 1-89 was drafted almost 20 years after NVIC 12-69 to expand the SEILOD program to other classes of vessels.¹¹ Both NVICs addressed the SEILOD process and the latter is an outgrowth of the former. NVIC 1-89 clearly envisions a proactive OCMI role ensuring the safety of commercial diving operations related to SEILODs.

Divers, Diving Equipment, and Operations: The underwater survey should not be conducted unless the inspector is satisfied that the equipment and procedures being used by the divers will provide a safe and meaningful examination of the ship. Safety must be foremost on the minds of all those working together on the actual diving operation. While matters in this regard are best left to the experienced, professional individuals normally found conducting this type of work, everyone involved in the survey should be alert to these needs and ensure that any requirements regarding this inspection can be safely accomplished. As required by 46 CFR 197.202, commercial diving operations

⁸ USCG Investigation, Vol. 4, IO exhibit 33 (Cliffs Drilling Co., Proposal to Conduct Inspection)

See 46 CFR 197 *et. seq.* Commercial Diving Operations; *Liveboating* means the support of a surface-supplied diver from a vessel underway. 46 CFR 197.204, 46 CFR 197.436(a)(2)

⁹ 46 CFR 197.206

¹⁰ testimony, Vol 1, pg. 21

¹¹ Tank Vessels, Cargo Vessels, other miscellaneous vessels, and Oceanographic Research Vessels less than 15 years old. 46 CFR 31.10-21(e) and 46 CFR 189.40-3(e) also permit continued participation in the underwater survey program for vessels 15 years old and older. Vessels more than 15 years old that have not previously participated in the underwater survey program are ineligible.

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taking place from vessels required to have Certificates of Inspection issued by the Coast Guard, regardless of geographical location, must comply with the provisions of 46 CFR Part 197 Subpart B – Commercial Diving Operations.

Acceptability of Diving Personnel and Equipment: A professional commercial diving firm should be employed by the owner. While specific approval is not required by the Coast Guard, a subjective evaluation by the OCMI or the attending inspector will be conducted. Such an evaluation may consider:

- (a) Prior experience or training;
 - (b) Qualifications of dive team members in photography, nondestructive testing (NDT), underwater damage repair, and other training and experience;
 - (c) The degree of professional approach/attitude, as evidenced by an organized dive plan, personnel assignments, standby and backups, compliance with appropriate safety regulations (Coast Guard, Occupational Safety and Health Administration (OSHA), various states), etc.¹²
7. Circulars are not usually meant to be binding on either the OCMI or industry. Generally, the Commandant promulgates them as advice to industry, which was clearly the case with NVIC 1-89.¹³ However, circulars also are strong advice on marine inspection issues to OCMI's. NVIC 1-89 clearly established a Commandant expectation that OCMI's examine commercial diving operations associated with SEILODs on vessels other than MODUs to determine whether the diving company is capable of conducting SEILODs safely.¹⁴
8. Two Memoranda of Understanding (MOU) between the Coast Guard and OSHA enabled the Coast Guard to act on behalf of OSHA for activities occurring on the Outer Continental Shelf, including commercial diving operations.¹⁵ The MOUs enable Coast Guard marine inspectors to conduct periodic onsite inspections to ensure compliance with health and safety regulations. To accomplish this, the Marine Safety Manual establishes a Commandant

¹² U.S. Coast Guard Investigation, Vol. 4, IO Exhibit 30, (NVIC 1-89, encl. 1, para. 5.f.)

¹³ "Underwater survey diving contractors *are encouraged* to use the guidance in enclosure (1) when preparing to conduct an underwater survey." NVIC 1-89, para. 4.b. (emphasis added)

¹⁴ None of this, however, indicates intent by Commandant to relieve the vessel owner or diving contractor of responsibility for safety. Especially since many SEILOD dives are conducted when Coast Guard personnel are not present. "It must be stressed that the underwater survey program is an option that the ship's owners/operators have elected to use. Responsibility for the management of the vessel, its personnel, and maintenance of necessary safety and service systems remains at all times with the master and his representatives." See NVIC 1-89, encl. 1, para. 5.a.

¹⁵ Memorandum of Understanding between the Coast Guard and OSHA dated December 19, 1979
Memorandum of Understanding between the Coast Guard and OSHA dated March 8, 1983

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expectation that marine inspectors verify compliance with commercial diving regulations coincident with other inspection activities.¹⁶

9. At the time of the casualty, Rig 12 was undergoing a Classification Society (Class) survey in addition to a Coast Guard SEILOD. Class for Rig 12 was the American Bureau of Shipping (ABS). A classification society is an organization, other than a flag state, that issues Certificates of Class and/or International Convention Certificates.¹⁷ The Coast Guard is statutorily responsible for safety of life and property at sea.¹⁸ But the Coast Guard may rely on ABS reports, documents, and certificates to complete its inspection duties.¹⁹ To complete Rig 12's inspection for certification and SEILOD, Coast Guard marine inspectors attended the vessel at least three times, on 1, 4, and 8 March 1996. During the inspection, they noted 37 deficiencies and worked with Cliffs' Director of Safety and Personnel, _____, and Rig 12's Offshore Installation Manager (OIM), _____, to ensure that the deficiencies were resolved. By March 8, Cliffs had cleared a majority of the deficiencies and Rig 12 was deemed by the marine inspectors to be fit for its intended route and service. The inspectors issued a new COI and endorsed the vessel's International Oil Pollution Prevention certificate and record of inspection card. The marine inspectors also issued a CG Form 835 as a worklist of 21 additional items to be fixed aboard Rig 12.²⁰ While Rig 12 was laid up, its operations manual, like all other inspection requirements, had been allowed to lapse. On 4 March, a copy of the manual was on board Rig 12 under review by the Coast Guard. The manual had not been approved as of 4 March.²¹
10. To satisfy the inspection requirements of Class and the SEILOD requirements of the Coast Guard, _____ contacted Texas NDE, a company specializing in nondestructive testing. One of Texas NDE's owners, _____, had worked for Cliffs on at least two other MODU inspections. Cliffs hired Texas NDE to do two types of nondestructive testing on Rig 12: (1) magnetic particle testing to detect cracks and welding discontinuities in the metal of the legs and mat and (2) ultrasonic testing (gauging) to determine hull thickness. Gauging was to be done at 40 spots selected by Class and Cliffs on the legs and mat of Rig 12. Typically, magnetic particle inspections are video taped for ABS and then submitted to the Coast Guard for review.

¹⁶ Marine Safety Manual, Vol. II, Chapter 16.E.1

¹⁷ Marine Safety Manual, Vol. II, Chapter 23.B.3.a

¹⁸ 46 USC Part B

¹⁹ 46 USC 3316

²⁰ U. S. Coast Guard Investigation, Vol. 6, IO Exhibit 65 (USCG Inspection Case # MI96008514); U.S. Coast Guard Investigation, Vol. 4, IO exhibit 29 (Inspection Worklist, 835 dated March 4, 1996)

²¹ _____ testimony, Vol. 2, pg. 150-151.

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Texas NDE

11. In 1996, [redacted] was Texas NDE's President and Operations Manager and had 15 years of NDT experience. [redacted] handled sales, hiring, payroll, and marketing in addition to doing much of the company's NDT work. [redacted] was certified by the American Society for Nondestructive Testing with Level II technical proficiency in ultrasonic, eddy current, and liquid penetrant testing. He also was Level III qualified in magnetic particle testing.²² Texas NDE also employed [redacted], [redacted], and [redacted]. Texas NDE began as a NDT company working on those portions of MODUs above the waterline. The company did not plan to do diving or underwater testing when it was formed. The company found though, that diving companies were reluctant to accept low paying shallow water jobs (defined by Austin as 30 feet or less) and Texas NDE saw potential for more work if the company included shallow water diving as part of its service. Of the four company employees, only [redacted] had prior diving experience. He had been a Marine Corps diver trained by the U.S. Navy. According to [redacted], "[h]e was the one who kind of guided us on what we needed to think about."²³ By 1996, [redacted] and [redacted] had each made, at most, two or three shallow water surface supplied air dives for the company.²⁴ [redacted]'s first surface supplied air dive was in 10 feet of water while working with a large diving company. [redacted] then took a YMCA SCUBA²⁵ class as a "starting point" to become proficient in commercial diving. The class met two nights a week for one or two months.²⁶ Aside from the 10-foot dive and the YMCA course, by 1996 [redacted]'s total diving experience consisted of five or six shallow water commercial dives made over the span of about five years.²⁷ Prior to 4 March, [redacted] had dived on two shallow-water NDT inspections for Cliffs similar to the Rig 12 job.²⁸ When [redacted] hired [redacted] to do NDT of Rig 12, Texas NDE did not have enough personnel available to do the job and [redacted] subcontracted with G&G Marine to provide divers.²⁹

G&G Marine

12. In 1996, [redacted] was the owner, operator, and sole manager of G&G Marine (G&G).³⁰ [redacted] began sport diving in the 1960's while in the military and after leaving the service in 1970, he went to work as a commercial diver for International Marine Technology in Houston, Texas. Two years later, [redacted] left to work for Underwater Technology, Inc., also

²² [redacted], testimony, Vol. 2, pg. 204-206

²³ [redacted], testimony, Vol. 2, pg. 216, 233

²⁴ Surface supplied air diving means the diver is supplied with compressed breathing air from the dive location. See 46 CFR 197.204 (Definitions)

²⁵ Self Contained Underwater Breathing Apparatus means the diver is supplied with compressed breathing air from diver carried equipment. See 46 CFR 197.204 (Definitions)

²⁶ U.S. Coast Guard Investigation, Vol. 4, IO exhibit 39 (YMCA card)

²⁷ [redacted], testimony, Vol. 2, 213-216

²⁸ [redacted], testimony, Vol. 2, pg. 217, 235

²⁹ [redacted], testimony, Vol. 2, pg. 223

³⁰ USCG Investigation, Vol. 4, IO exhibit 40, ([redacted] "Sworn Statement", Houston, May 19, 1999, pg. 23); [redacted] was still the owner/operator of G&G at the time of this writing.

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based in Houston. learned his trade "on the job" by watching other, more experienced divers and made over 100 surface supplied air dives every year for those companies. In that time, conducted hull surveys, damage inspections, and cleaned ships' hulls. He worked in the Gulf of Mexico, Central and South America, and the Caribbean. In 1974, started his own company, Gilbert Marine, and twelve years later merged with Taylor Diving & Salvage.³¹ worked at Taylor for 18 months as manager of ship diving. In that capacity, he solicited work cleaning ship hulls and conducting ship surveys. bid jobs and assigned dive teams from a pool of 200 divers. One of his responsibilities was to assign and designate, in writing, dive supervisors for every job. In 1988, left Taylor to start G&G Marine in Houston, Texas.³²

13. At G&G, workers, scheduled jobs, and directed field operations. G&G's practice for equipping its dive operations appears to be consistent with industry practice. "[The diver is] responsible for his -- what we call personal dive gear, which is your wet suit (if required), coveralls, booties, fins, weight belt, harness, knife, hand tools (i.e., crescent wrenches, a pair of pliers), gloves, a bailout bottle, if they want one. They are not required to supply their own diving helmet. We have one that's available."³³ , and all used their own helmets for the Rig 12 diving job.³⁴ Aside from the personal dive gear, "G&G supplied everything from the end of the hose back."³⁵ This meant that when G&G sent divers into the field, the company supplied air compressors, hoses, gauges, video equipment, and cables -- the larger, more expensive equipment. G&G had once been a member of the Association of Diving Contractors (ADC), but by 1996 had withdrawn G&G's membership for "personal reasons."³⁶ Nevertheless, in 1996 G&G's operations manual claimed that G&G still complied with all ADC standards. Both ADC and G&G's standards called for two divers and one tender on a dive like the Rig 12 inspection.³⁷
14. G&G's procedures for outfitting a dive operation were not set out in the company's operations manual or any company policy.³⁸ When G&G sent divers to a job, diving equipment was selected and loaded at the direction of any one of several people.

³¹ USCG Investigation, Vol. 4, IO exhibit 40, (statement, pg. 16)

³² USCG Investigation, Vol. 4, IO exhibit 40, (statement, pg. 20)

³³ USCG Investigation, Vol. 4, IO exhibit 40, (statement, pg. 106)

³⁴ , testimony; Vol. 1, pg. 315-317.

³⁵ , testimony, Vol. 1, pg. 169

³⁶ USCG Investigation, Vol. 4, IO exhibit 40, (statement, pg. 87)

³⁷ "There is no standard size dive crew. Each individual job will dictate the number of persons detailed for conduct of the dive operations. The dive crew composition will be dictated by physical and environmental conditions and, by regulatory requirements published by the various agencies under which the operations will be conducted. However, in no case shall G&G Marine operate with fewer persons than as set forth in the Diving Consensus Standards of the Association of Diving Contractors."; USCG Investigation, Vol. 4, IO exhibit 16, (G&G's Safe Practices and Operation Manual, pg. 1-4); , testimony, Vol. 1, pg. 258-259; USCG Investigation, Vol. 4, IO exhibit 57, (ADC Consensus Standards, pg. 3-24(D))

³⁸ USCG Investigation, Vol. 4, IO exhibit 16, (G&G Safe Practices and Operation Manual)

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apparently made equipment lists.³⁹ So, too, did the dive personnel.⁴⁰ _____ a G&G employee, testified that several years after he began working at G&G, one of the employees "raised a fuss" about needing a secondary air supply when diving.⁴¹ Thereafter, it became company policy to send a secondary air supply on dives, though insufficient evidence was found to determine whether the policy was ever put into writing.⁴² G&G did not require divers to use bailout bottles as a tertiary air supply, nor were bailout bottles discussed in G&G's safety manual.⁴³ G&G did maintain dive logs, but had a policy of throwing them away at the end of each pay period.⁴⁴

15. In 1996, G&G did not have a shop manager or anyone charged specifically with routine equipment maintenance. At one time, for about a year in 1989 or 1990, G&G employed Mr. _____ strictly to maintain equipment. Mr. _____ also may have been responsible for ensuring that air quality testing on G&G's compressors was completed. When _____ left in about 1990, he was not replaced and no one else was designated as the equipment maintenance person. Nevertheless, for about a year after _____ left the company, G&G's maintenance program was efficient enough to ensure that air quality testing continued.⁴⁵

16. _____ said that he was responsible for shop maintenance, but that all G&G employees would identify equipment problems and bring them to his attention.⁴⁶ From time to time, _____ also paid divers to work in the shop maintaining equipment.⁴⁷ Starting in about 1993, the maintenance program, at least for the Quincy 325 compressor used on Rig 12 (Compressor 2)⁴⁸ consisted of periodically changing the engine oil, compressor oil, and filters (See figures 2 & 3). Between February 1993 and March 1996, Compressor 2's engine oil was changed eight times, the compressor oil three times, and air intake filters four times. The compressor maintenance log required by 46 CFR 197.480, and 197.482(d) does not indicate that any other repairs or modifications were made to Compressor 2 during that period.⁴⁹ _____ indicated that routine maintenance like checking compressor oil levels, was done as equipment was loaded for shipping to dive sites. However, during his equipment

³⁹ USCG Investigation, Vol. 4, IO exhibit 15, (G&G equipment list)

⁴⁰ _____ testimony, Vol. 1, pg. 136-138

⁴¹ _____ testimony, Vol. 1, pg. 152

⁴² USCG Investigation, Vol. 4, IO exhibit 16, (G&G's Safe Practices and Operation Manual)

⁴³ USCG Investigation, Vol. 4, IO exhibit 40, (_____ statement, pg. 92)

⁴⁴ USCG Investigation, Vol. 4, IO exhibit 40, (_____ statement, pg. 91)

⁴⁵ _____, testimony, Vol. 1, pg. 441-442, 447; 46 CFR 197.340 (Breathing gas supply) and 46 CFR 197.450 (Breathing gas tests)

⁴⁶ USCG Investigation, Vol. 4, IO exhibit 40, (_____ t statement, pg. 44)

⁴⁷ USCG Investigation, Vol. 4, IO exhibit 40, (_____ t statement, pg. 51)

⁴⁸ Generally referred to as Compressor 2 by G&G employees. USCG Investigation, Vol. 4, IO exhibit 40, (_____ statement, pg. 41)

⁴⁹ USCG Investigation, Vol. 4, IO exhibit 40, (_____ statement, Exhibit 1); _____ testimony, pg. 164-166; _____ testimony, Vol. 1, pg. 442

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loadout on 3 March 1996, did not check Compressor 2 before it went out for the Rig 12 job.⁵⁰

17. One employee working for G&G on 4 March 1996 was . He worked for G&G for seven years as a diver and occasionally as an in-house maintenance person.⁵¹ was familiar with all four compressors G&G owned in 1996, and had worked on each. testified that G&G often would not buy replacement parts to do ordinary equipment upkeep. As an example, testified that G&G employees would put red shop rags or Kotex pads in a supply side air intake filter housing when factory specified air filters were not available. indicated that, before 4 March, there was a strong likelihood that a red shop rag weighted down by marbles had been put in the air intake filter housing of Compressor 2 in lieu of an ordinary filter. did not know whether the rag had been removed or replaced by 4 March.⁵² also testified that Compressor 2 had malfunctioned on a diving job several months before the Rig 12 job and had been set aside so it would not be used on other jobs. To s knowledge, Compressor 2 had not been repaired before the Rig 12 job. also did not know whether Compressor 2 had a factory specified filter on 4 March since he did not check the air filter housing before using the compressor.⁵³
18. When asked (three years after the casualty) to produce receipts for purchases of routine maintenance and parts for G&G's compressors, produced four receipts, three dated in 1993 and one in 1998.⁵⁴ None of the receipts indicated purchases of an air filter for Compressor 2.

⁵⁰ USCG Investigation, Vol. 4, IO exhibit 40, (

t statement, pg. 48)

⁵¹ USCG Investigation, Vol. 4, IO exhibit 40, (443.

t statement, pg. 50-51)

, testimony, Vol. 1, pg.

⁵² ; testimony, Vol. 1, pg. 459-465, 510

⁵³ , testimony, Vol. 1, pg. 513-514

⁵⁴ USCG Investigation, Vol. 4, IO exhibit 41, (Guard Investigation, Vol. 5, IO exhibit 56, (399

work order dated September 11, 1998) and U.S.Coast receipts for G&G Marine); testimony, Vol. 2, pg.

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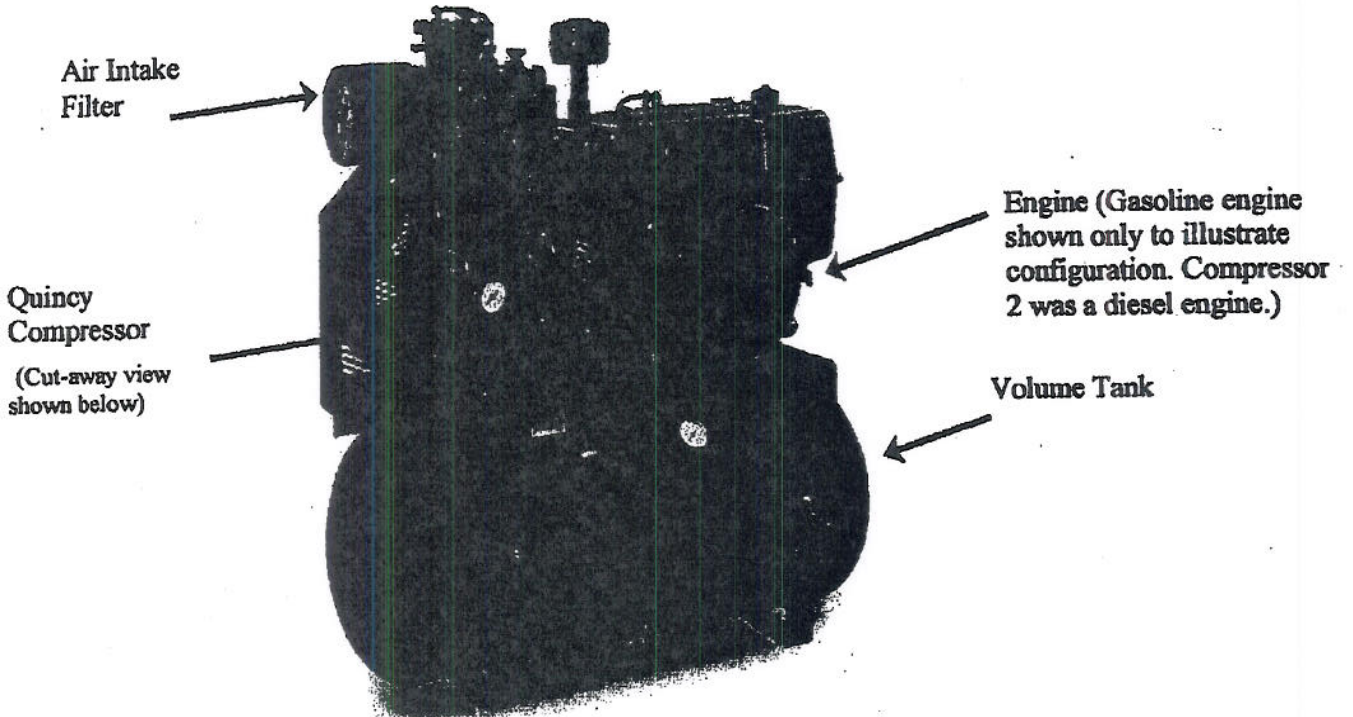


Figure 2: Quincy Compressor System

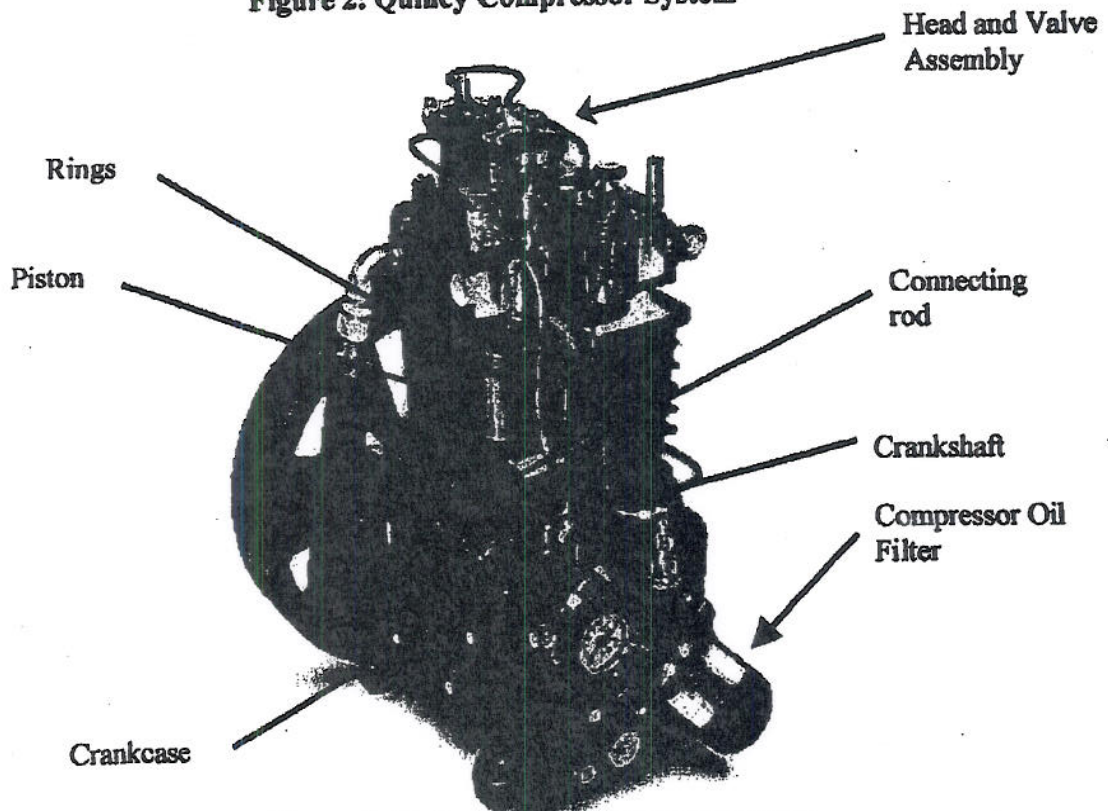


Figure 3: Quincy Compressor (cut-away)

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19. G&G's diver training program focused on ship maintenance rather than diving fundamentals.⁵⁵ believed that when a diver graduated from dive school he was fully qualified to dive on any company job.⁵⁶ This was not consistent with training and qualification programs at other, larger, diving companies or in the military. One large diving company operating in the Gulf of Mexico, Oceaneering, expects a prospective diver to begin his career by working two or three years as a dive tender, with the majority of his time spent assisting dive operations and doing light to moderate diving under close supervision. The employee then graduates from tender to diver and will spend one or two years learning his trade to become fully qualified. A diver can, but is not guaranteed to, progress over time to dive supervisor after more training.
20. G&G's practice, by comparison, was to use a prospective diver as a tender for two or three months during which time he might carry out five or six dives under the supervision of a more experienced diver. Depending on workload demands, G&G then would deem him to be a fully qualified diver. Training at G&G was on the job. "We don't hire just divers and we don't hire just tenders. We found over the years that our best people are people that we hire straight out of commercial diving school and we teach them how to dive the way we want them to dive. And we give them the opportunity to get in the water quicker than they would with Cal Dive or American Oil Field Divers or Oceaneering - somebody like that."⁵⁷
21. was a commercial diver who, by March 1996, had worked for for approximately 13 years; which practically speaking, was his entire commercial diving career. began recreational SCUBA diving about 1979. Four years later, he attended a six-month course at a commercial dive school in Houston and was hired by (either when was with Taylor or as he started G&G) three months after graduating. started with company as a dive tender, a job he described as one of setting up dive stations, waking the divers, tending to a diver while he is in the water including holding his hose, and following directions. Additionally, at the end of day, the dive tender broke down the dive station and stowed and refueled equipment as directed. went to work with immediate expectations of becoming a diver, but as the newest employee he expected also to do the more menial work. described his progression from diver to dive supervisor as accidental.

Q. When did you first act as a dive supervisor for G&G?

A. That, I couldn't tell you. Several years.

⁵⁵ USCG Investigation, Vol. 4, IO exhibit 40, (

statement, pg. 70-72)

⁵⁶ USCG Investigation, Vol. 4, IO exhibit 40, (

statement, pg. 70-71)

⁵⁷ USCG Investigation, Vol. 4, IO exhibit 40, (

statement, pg. 16)

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Q. And what had you done in that process to become qualified to be a dive supervisor?

A. I don't know. I wish I knew, or I would have not done it.

Q. When did you know you were ready to be a dive supervisor?

A. I more or less got crowded into it. I never wanted to be.⁵⁸

22. later changed his estimate of the time to become a dive supervisor at G&G to five years. He quit working for G&G approximately 10 months after the death of
⁵⁹

23. indicated that compressors failed from time to time while on G&G diving jobs. When that happened, it was the dive supervisor's responsibility to diagnose the problem. For , the process was simple; it would be obvious if the motor side quit because the compressor is loud and when it went silent it meant the motor had quit. But, if the compressor side quit, but not the motor, he would know by checking the air gauges.⁶⁰

24. was a 23-year-old commercial diver with two years diving experience at the time of the diving casualty. graduated from University Prep High School in Seattle, WA and became a certified SCUBA diver at the age of 21. attended a commercial dive school, Divers Institute of Technology, Inc., in Seattle and graduated in February 1994. When he graduated, was certified Level II in Ultrasonic Testing, Liquid Penetrant and Magnetic Particle by the American Society for Nondestructive Testing. also received a certification deeming him proficient to perform maintenance and repair on the SuperLite 17 & 27 Helmets and KMB-18 & 28 Band Masks.⁶¹ After graduating, was first employed by Professional Divers of New Orleans and in 1995 he moved to Houston, TX with his wife, to work for G&G Marine. There was insufficient evidence to determine how many dives made with G&G before 4 March 1996. The best evidence would have been G&G's dive logs. However, testified that G&G maintained dive logs only until the end of each pay period and then threw them away. indicated that , dive logs for G&G had been destroyed.⁶² The testimony indicates only that had dived on several jobs for G&G before 4 March.

⁵⁸ , testimony, Vol. 1, pg. 120, 145-146

⁵⁹ , testimony, Vol. 1, pg. 146; , testimony; Vol. 1, pg. 121

⁶⁰ , testimony, Vol. 1, pg. 192-193

⁶¹ USCG Investigation, Vol. 5, IO Exhibit 45, (Diving Records of)

⁶² USCG Investigation, Vol. 4, IO Exhibit 40, (Statement, pg. 91 - 94)