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

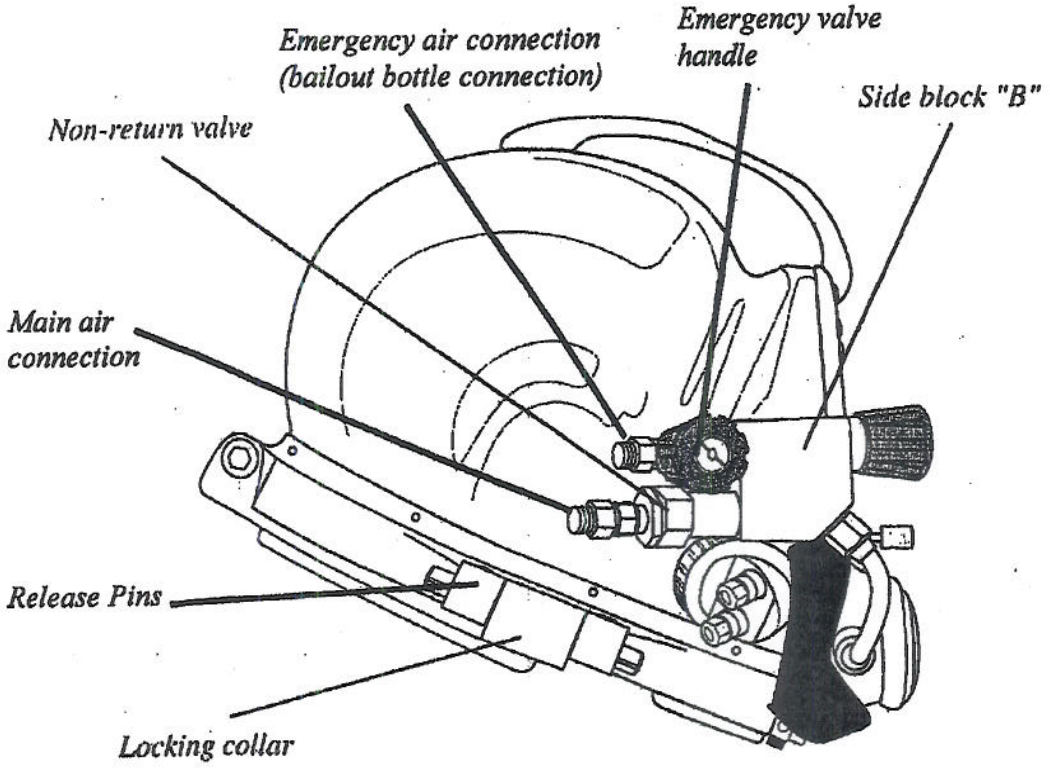

Figure 7: Side view of SuperLite-27 helmet

42. At about 1645 hours, was watching the ultrasonic gauging monitor while operated the air rack and directed [106] checked the pressure gauge and saw that the pressure had again dropped to 90 psi. told once again to close his free flow valve, but said that the valve was already closed. At this point, realize there was a larger problem. Over the next several minutes had a garbled conversation with , during which 's manner became increasingly frantic and his breathing rapidly increased to the point it was apparent he was hyperventilating. "He [ ] just kinda went into a whirl. He wouldn't really talk to me on an even keel, and he wouldn't respond to me. I mean, it just got away from him."[107] During the conversation, complained of not being able to breathe and said that he heard a hissing noise. speculated that he might have forgotten to tighten the airline to his helmet before

106 testimony, Vol. 1, pg. 202
107 testimony, Vol. 1, pg. 221

his dive and thought the line might have worked free.[108] testified that had not previously complained about his breathing.[109] As continued to hyperventilate, pulled on his umbilical to bring him to the surface. discovered that the hose was fouled and he couldn't pull up. instructed to unfoul himself so that could haul him up, but didn't respond.[110]

43. then took Compressor 2 offline and changed the valve configuration on the air rack to feed s umbilical from one of the standby high-pressure air bottles. According to "[he] blew through" the air cylinder in 15 minutes, meaning that the bottle was used up in that amount of time.[111] testified two high-pressure air bottles had been brought to Rig 12 but only one was pressurized.[112] The one high-pressure air bottle was able to use contained 2250 psig of compressed air.[113] As the high pressure air bottle quickly depressurized, continued to hyperventilate, and then his breathing "dropped to calm, controlled breathing, almost like he went to sleep."[114]

44. At 1650 hours, , the OIM, was told there was a problem at the dive station. ran to the station and discovered that rig personnel were stringing together 150 feet of oxygen-acetylene cutting torch hose to create a makeshift air line. The intent was to attach the line to dive helmet to supply with pure oxygen from a welding torch high-pressure oxygen bottle.[115]

45. had decided to send down as a rescue diver because was already in his wetsuit and it would have taken too long to get dressed out.[116] described his decision this way.

> It would have took me forever to get in my rig . . . . To be honest with you, my first reaction was to go in the water. I was going for my hat and realized it was incomplete. Or, to make it complete, it would be like, for lack of a better description, dressing an astronaut. I had to make up the suit and the whole nine yards.[117]

46. Several witnesses indicate that it took 15 to 20 minutes to configure the makeshift airline to helmet. A safety rope was wrapped around s waist and he was lowered into the water by the same personnel basket used for . Elapsed time from when

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108 , testimony, Vol. 1, pg. 220-223, 226
109 , testimony, Vol. 1, pg. 213-215
110 , testimony, Vol. 1, pg. 221 - 226
111 , testimony, Vol. 1, pg. 222-225, 235
112 , testimony, Vol. 1, pg. 235, 322
113 , testimony, Vol. 1, pg. 225
114 , testimony, Vol. 1, pg. 223
115 , testimony, Vol. 1, pg. 235, 237
116 , testimony, Vol. 1, pg. 234
117 testimony, Vol. 1, pg. 302-303

decided to send a diver down to to when went into the water was approximately 20 minutes.[118] made an initial dive but quickly returned to the surface complaining that the airline was too short and that he needed additional weight (indicating that he could not overcome the natural buoyancy of his neoprene wet suit). Rig personnel found several shackles and configured them so that they could be secured around waist. Additional air hose was attached for greater diving range and began his second dive. After several minutes he returned to the surface and announced that he had found 's motionless body below, but could not bring him up because a line restrained him from floating free. asked for wire cutters to use to free and started to make a third dive. However, just before re-submerging, decided he was not able to continue and refused to perform the dive.[119] immediately put on s helmet and entered the water. reached on his first try and grabbed hand to let him know help had arrived. noted a steady stream of bubbles pouring from the whiskers of helmet (See figure 6).[120] found floating at a 45-degree angle to a horizontal plane, with a small amount of water in his helmet. saw that axe had become fouled on a pipe running horizontally along the deck of the mat. cut the lanyard connecting axe to his dive belt and pulled him to the surface.[121]

47. testified that he boarded the personnel basket to assist in the rescue effort and that when brought to the surface, grabbed the umbilical to pull toward the personnel basket.[122] testified that as he pulled the umbilical, diving harness came free and then the airline came free from helmet.[123] then shoved toward the basket and Townsend hauled into the basket.[124] testified that he reached up while in the basket and depressed the locking collar's four release pins so the helmet would come off (See figure 7).[125] also testifies that the helmet was taken off in the basket as it was hoisted onto Rig 12's deck.[126] On the other hand, an independent contractor working on Rig 12, testified that when was placed on the deck of Rig 12, helmet was still attached and locked to his diving collar. noted this because he had trouble taking helmet off to administer CPR. He said that, while was on the deck of Rig 12, was not able to release the helmet, causing to have to remove it and allowing about a cup of water to spill from the mask. While struggled to release helmet, he noticed that the

118 , testimony, Vol. 1, pg. 40
119 , testimony, Vol. 1, pg. 237-238; , testimony, Vol. 3, pg. 123
120 , testimony, Vol. 1, pg. 246, 317; Whiskers refer to black plastic vents on both sides of the helmet.
121 , testimony, Vol. 1, pg. 238-239, 245-248
122 testimony, Vol. 3, pg. 122-125
123 testimony, Vol. 3, pg. 125-127
124 testimony, Vol. 3, pg. 129, 142
125 testimony, Vol. 1, pg. 249
126 , testimony, Vol. 3, pg. 129-130

airline was still connected to the helmet.[127] Despite the conflicting testimony, all witnesses agreed that when helmet was removed, his face was blue.[128] and others began to administer CPR immediately.[129] The elapsed time for the rescue was approximately 30-40 minutes.[130]

48. About 8 minutes after CPR began, at around 1800 hours, a helicopter arrived on board Rig 12.[131] was quickly hoisted into the helicopter and transported to St. Mary's Hospital in Port Arthur, TX; elapsed time was 13 minutes from the deck of Rig 12 to the hospital.[132] Doctors at the hospital attempted to resuscitate for several hours, but he was pronounced dead at 2230 hours.[133] No one at the Coast Guard formal hearing was able to testify whether displayed any signs of life when was brought back on board Rig 12. However, Dr of the Navy Experimental Diving Unit speculated, based on the hospital reports, that the rescuers found or were able to restore a heartbeat (see Finding of Fact 62 below).

Post Casualty Events

49. An autopsy of body found that his lungs were boggy and congested and his stomach had no residual food fragments. The coroner concluded that cause of death was drowning.[134]

50. Cliffs properly notified the Coast Guard of the casualty and completed all necessary Coast Guard documentation.

51. Coast Guard Investigating Officers did not attend Rig 12 after the accident and did not secure Compressor 2 as part of the original investigation. By the time of this hearing, Compressor 2 had been disassembled and was not available for examination.

52. On 6 March 1996, directed to take Compressor 2 to McKenzie Equipment Co., Inc. (McKenzie) in Houston. spoke to McKenzie's service manager. "I told him we had a compressor that we needed checked out, and I wanted him to look at it and give me a letter back saying that it was in good condition; it was running; it was maintaining pressure at 150 psi or it wasn't."[135] McKenzie would not certify the compressor

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127 testimony, Vol. 1, pg. 28-39; See too testimony, Vol. 1, pg. 373
128 testimony, Vol. 1, pg. 250
129 testimony, Vol. 3, pg. 131
130 testimony, Vol. 1, pg. 42; testimony, Vol. 1, pg. 101
131 testimony, Vol. 1, pg. 44; testimony, Vol. 3, pg. 133; testimony, Vol. 1, pg. 97-98
132 testimony, Vol. 1, pg. 105
133 USCG Investigation, Vol. 4, IO exhibit 44 (Death Certificate of)
134 USCG Investigation, Vol. 4, IO exhibit 27, (Autopsy report of)
135 USCG Investigation, Vol. 4, IO exhibit 40, (statement, pg. 32)

as being functional and did not produce such a letter. testified that someone from McKenzie called him back to say that the compressor would run and would hold pressure at 150 psi, but if the compressor wasn't repaired, " . . .you could have problems down the road."[136] The McKenzie employee told that the repairs were so extensive it would be more cost effective to replace the compressor than repair it. then directed McKenzie to replace the compressor. A McKenzie mechanic, , broke down Compressor 2 and produced a deficiency report:

-Valve seat on head bad

-Unit needs overhaul – oil carryover

-Valves are not holding – needs new rings, bad carbon buildup

-Needs 110823-325 Overhaul Kit

-Rings HP

-Rings LP

-Air Filter

-6609 Head

concluded his write up by recommending replace Compressor 2 rather than repair it.[137] testified that when he returned to McKenzie's to pick up Compressor 2, a mechanic reported that the compressor's main problem was that a rag had been sucked through the cylinder.[138]

53. About two months after Compressor 2 was examined, a McKenzie employee, was asked by the owner, , to gather any available paperwork on the examination.[139] In the course of his investigation, questioned about Compressor 2 and gathered the deficiency report described above and contained in IO Exhibit 19. described the exhibit. "Well, it's a teardown. It's basically a teardown inspection whereby tore the compressor down, estimated what was wrong with it and what it would take to repair it as far as cost."[140] described McKenzie's process for evaluating compressors. "[T]hey put it on a test standard run. They try and pump up pressure and maintain pressure with the compressor. . . It's done on every unit. And if it doesn't hold, then they start to disassemble it, which is usually the head section comes off first. So, that's what I say, basically what he found were the heads – the seats and the heads were bad. They had a lot of oil carryover and bad rings. So, based on the cost of the parts versus the cost of a new one, it exceeded 50 percent, which we would normally recommend a

[136] USCG Investigation, Vol. 4, IO exhibit 40, (statement, pg. 33-34)
[137] USCG Investigation, Vol. 4, IO exhibit 19, (Invoice from McKenzie to G & G Marine)
[138] , testimony, Vol. 1, pg. 485-486
[139] testimony, Vol. 1, pg. 420
[140] testimony, Vol. 1, pg. 387

replacement."[141] testified that the oil carryover, bad rings, heads, and seats described as bad were compressor parts, not engine parts.[142]

54. Several months after the casualty, as part of civil litigation related to the casualty, a hand-written page of notes was discovered and identified as the dive log of for 4 March. notes, made nearly contemporaneously with the casualty, begin by indicating that "[C]ompresser [sic] was not keeping up to 150 psi but maintained 80 psi."[143]

55. also was deposed during the civil litigation in August 1997. He described a conversation he had with on the night of 4 March 1996 about the Rig 12 dive. "He [ ] had said that they had gotten out on the job and the compressor wasn't working right; so, he worked on it a little bit, got it holding air for a little while. And they initiated the job and was almost done with the dive that was on when the compressor started losing air."[144] went on to testify about the mechanical condition of Compressor 2 prior to the Rig 12 job.[145]

Q. Was that [Compressor 2] one of what you considered to be the three working compressors?

A. It wasn't working properly, but it was one of the compressors that we used.

Q. Was it normally used as a primary source of air?

A. No.

Q. Had you been having problems with that particular compressor?

A. Yes.

Q. For how long a period of time?

A. I can't say exactly, but probably two to three jobs prior to that.

Q. And what type of problems had you been experiencing with that compressor that was ultimately taken out to the Cliffs job?

A. It wouldn't – the pilot valves weren't functioning.

Q. What are pilot valves?

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[141] testimony, Vol. 1, pg. 387-389
[142] testimony, Vol. 1, pg. 391
[143] See IO Exhibit 70
[144] See IO Exhibit 71
[145] See IO Exhibit 71

A. They're the air pressure source which controls the air pressure and the air volume.

Q. So, if you've got a pilot valve that's malfunctioning on a compressor, would that affect the ability of the compressor to hold air?

A. Sure.

Q. Would it affect the ability of the compressor to pump the proper volume of air?

A. Sure.

Q. And for at least two or three jobs, this particular compressor that was involved in accident had had problems holding air?

A. Yes.

56. Several days after the casualty, Mr. , father, visited the G&G facility in Houston, Texas. found Kirby, Morgan SuperLite 27 helmet sitting on the floor of the G&G warehouse. confiscated the helmet and took it home. stated after the hearing that the helmet was not adjusted while in his custody.

57. Slightly more than a year after the accident, helmet was sent for examination to the Navy Experimental Diving Unit (NEDU) in Panama City, Florida. Mr. reports that the helmet was not used, repaired or adjusted while it was in his control, before being sent to NEDU. NEDU found that Kirby, Morgan SuperLite 27 diving helmet's demand regulator was not set according to the manufacturer's specifications. NEDU tested the helmet as it was set up when used it. In the initial test, NEDU found that, at 80 psig, the helmet would perform "reasonably well to a depth of 33 fsw . . . which would supply gas to a moderately hard working diver, although the respiratory effort would be high, far exceeding the NEDU performance goal."[146] NEDU then tested the helmet at the air pressures recommended for the Kirby, Morgan SuperLite 27. In the words of NEDU, "Interestingly, during the set up, as supply pressure was increased to 165 psig, the helmet experienced free-flow from the second stage regulator at approximately 100 psig. This free-flow condition at 100 psig necessitated making a demand regulator internal adjustment prior to supplying the helmet with an optimum supply pressure of 165 psig. This suggests that either the regulator was adjusted anticipating a supply pressure less than the manufacturer's recommended minimum or that the regulator was improperly adjusted."[147]

[146] psig "pounds per square inch gauge"; fsw "feet of salt water"
[147] USCG Investigation, Vol. 4, IO exhibit 26, (SuperLite diving hat report, pg. 2)

58. At the formal hearing to investigate death, 22-24 June 1999, Master Chief Petty Officer , a U.S. Navy master diver, testified about surface supplied air diving practices. Master Chief offered his opinion on a number of diving safety issues related to the casualty. He first discussed ; YMCA SCUBA training and whether that training was enough to allow to work safely as a surface-supplied air commercial diver.

> Q. Based on [what you've heard about training], do you think that qualifies a person to be a dive supervisor?
>
> A. No, I do not.
>
> Q. Why not?
>
> A. And I would like to expand and say I don't believe that qualifies you to be a commercial diver either.
>
> Q. Okay. Why not?
>
> A. The issue of a commercial diver, first: He has no formal training in the rig that he's using. He knows nothing of the operational – it's possible that he knows nothing of the operational characteristics of the equipment, how to maintain that equipment, how to set that equipment up for use, how to properly use that equipment, how to recover from a possible emergency relating to that equipment. If he's doing – and it's obvious surface-supplied diving is the intended purpose of the SuperLite 27, may not be familiar with decompression procedures and those kind of things.[148]

59. In addition to Master Chief 's analysis of capabilities, he also analyzed experience and ability to be a dive supervisor. In summary, he said that experience as a diver alone does not qualify a person to be a dive supervisor. The Master Chief referred to his own career in the U.S. Navy as an example. Master Chief said that after graduating from Navy diving school and working as a Navy diver, if he had been asked whether he could perform as a dive supervisor, "I would have told them I felt like I could have done it."[149] But, the Master Chief indicated, after he went to school to be trained as a dive supervisor, he learned how much more was demanded of a supervisor than he had known.[150]

60. Master Chief analyzed the predive procedures exercised by the G&G Marine employees before began his dive.

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148 testimony, Vol. 3, pg. 183-184
149 testimony, Vol. 3, pg. 185-186
150 testimony, Vol. 3, pg. 185-186

Q. From everything that you've heard so far . . ., regardless of whether it was done in the exact same fashion or . . . the same methodology that the Navy would do it, did the predive preparation occur, in your estimation, in a safe way?

A. No. . . . A diving supervisor was not assigned . . nobody [was] in charge. . . There is no – there is a lack of verification, if you will, as to whether or not the compressor has, in fact, been checked for a proper level of oil; that strain relief – if you use strain relief as your interface hoses between the compressor and the volume tank, are attached; that these connections are, in fact, secure, wrench tight; that they have been soap tested; that they're free from kinks, free from being stepped on; that they have been visually inspected for cuts, nicks, gouges, and other deformities; that the intake is, in fact, free from obstruction; that the intake is upstream of the exhaust – not only the prime mover; if it's a diesel or an engine, but also upwind from any other potential sources of carbon monoxide.

There is also the inspection of the umbilical itself, walking that out; the attachment to the hat. There is the inspection in the predive procedures for the hat itself. In this particular case . . . I see a problem in the industry. As a commercial diver, you are expected to show up on the site with your own hat. As I have heard, the company will provide you with the umbilical. You make the connection and you go to work. So, therefore, you have a great amount of variation as to whether or not any maintenance is done on the hat itself; and at that interface [the helmet/hose connection] you're setting yourself up for trouble. . . . And I see that as an industry problem.[151]

61. Master Chief believed that, because the umbilical was secured to dive harness, there was little potential that main airline had come loose during his dive. The Master Chief felt it was possible had inadvertently unscrewed his main airline from his helmet near the end of his dive. The Master Chief characterized that scenario as "plausible".[152] But, he said "I have heard testimony that suggested, that we're asked if he went and checked the connection and felt that it was loose and attempted to tighten the connection and that, perhaps, then he went the wrong way. I believe that that is plausible. . . . But that would have been – that truly is secondary, in my mind, to – to the first issue, which is the guy did not have an adequate air supply and that corrective action was not taken in a timely manner when discovered."[153] Master Chief concluded that, during his dive, experienced a condition called Hypercapnia.[154]

62. Dr. , the Scientific Director for the Navy Experimental Diving Unit also testified at the formal hearing on 22 – 24 June 1999. Dr. adopted the analysis of Dr.

151 testimony, Vol. 3, pg. 199-201
152 testimony, Vol. 3, pg. 215, 218
153 testimony, Vol. 3, pg. 218-219
154 testimony, Vol. 3, pg. 215

made during the civil litigation.[155] Dr. added his own observations as follows:

> Most divers, if they're working hard and begin to sense a buildup of CO2, will ventilate, as this diver did, with a steady flow valve [free flow valve]. Then if this happens more than once or twice, typically the diver would stop work, take more of a breather; and once he's caught his breath again and things are back under control, continue working.
>
> From what I heard in the testimony yesterday, apparently the diver was operating a steady flow valve repeatedly and only closed the steady flow valve when the – somebody topside explained to him that he was going to lose gas pressure unless he did that. That situation undoubtedly crests to a point of panic. To me, the cause of panic would be the realization that he did not have enough gas perhaps, also if he could not make an escape to the top; but that is purely conjecture.
>
> *Obviously the diver was not getting the gas he needed,* whether it was from low ops from a compressor or due to the leakage of the gas umbilical. I certainly have no evidence to suggest that it's one or the other. I cannot tell. I don't see any evidence of that.
>
> Looking at the autopsy results, we have an indication that the diver, while being ventilated on a ventilator – and I'm assuming he did attain signs of rhythm again once he was in the hospital. Otherwise, he probably would not have been on the ventilator. In other words, the C.P.R. was effective in sustaining him to get his heart going. . . .
>
> [A]lthough some divers can work with a helmet that's putting out a low gas supply, other divers – and not necessarily do I mean inexperienced divers, but just other divers prefer to work with higher flow levels for their gas. Some divers will tolerate a large amount of CO2 in their bloodstream and get along just fine. I personally have worked with divers who have exercised very vigorously under hyperbaric conditions and claim that they're very happy – they're very comfortable, and then suddenly go unconscious because, in fact, they were comfortable because they weren't breathing hard; but at the same time their arterial CO2 was steadily climbing, steadily climbing and finally reached a point where unconsciousness snuck up on them and they were totally unaware and boom, they were out like that [indicating the test subject lost consciousness].
>
> And the other divers, which I basically consider to be safer divers, are those who do not like the feeling of having their gas restricted, who like keeping their arterial CO2 levels down and want a lot of gas. Eventually they'll reach a point when they feel they're not getting enough gas, and they'll stop. "I'm not doing this anymore" or "I'm going to stop and take a breather, catch my breath, ventilate," whatever.

[155] See USCG Investigation, Vol. 4, IO exhibit 28 (Statement of Dr.).

> I suspect all these things were going through mind at the time, and he undoubtedly did stop and ventilate himself. However, in spite of those efforts, if his gas supply was still wanting, his mental confusion would get progressively worse; and at some point he might have started taking actions that were not in his best interest.
>
> It is possible – again, solely conjecture – that in the confusion, he may have reached back and started releasing something he shouldn't have [referring to the possibility that disconnected his main airline from his helmet]. I have no idea. But what we do know is that in the course of sustaining a large carbon dioxide insult, you become very anxious. It sounds like was becoming anxious. Of course, if somebody cut off our air supply, anybody would become anxious; but CO2 alone can do that. And then you begin to be increasingly confused, mentally, and not able to think straight and not able to – at one point eventually, to not even be able to respond to what is being said by topside. You're not aware of anybody else talking to you. You're totally involved in yourself. It's a strange and very dangerous state that you end up in; and if the situation is not remedied immediately, then eventually CO2 can reach such high levels that you can convulse and become unconscious. Of course, at that point, if you have one in a helmet, then partial drowning is more or less inevitable. It will happen. . . .
>
> One question is how would water get into the helmet? That, to me, makes me believe that, perhaps, the umbilical was connected because in the course of making large respiratory efforts, it's quite possible to create negative pressures inside the helmet, enough negative pressure to balloon the neck dam backward and actually pull water up past the neck dam.
>
> It's also possible to pull water in through the exhaust valves. It's one of the concerns we have about using a helmet like this, as it is, for contaminated water diving. If you're making large respiratory motions, you will get water coming backwards through the exhaust valve.[156]

63. Dr. , a consultant in the civil litigation, offered the following analysis of the casualty:

> Based upon my review, I have reached the following opinions:
> commenced his inspection dive from the MODU early in the afternoon of 4 March 1996. There is no record of a pre-dive equipment check or an in-water check for leaks, but there would have been a flurry of bubbles initially since the water was cold and he was wearing only a neoprene wetsuit with no provision for hot water supply. Sudden immersion in cold water causes a marked increase in breathing rate, and, depending upon his position in the water the bubbles from his exhaust could have obscured any leaks.

[156] Dr. , testimony, Vol. 2, pg. 85-91 [emphasis added].

He began his underwater task of applying the ultrasonic device to sites on the mat previously cleaned by the AOD crew (in the relative comfort of hot water suits) but soon began to experience heavy breathing resistance in the demand mode, requiring a switch to free flow mode. This caused problems: the single compressor (there was no secondary or standby compressor) was unable to maintain adequate air pressure or flow on open circuit. Each attempt to "catch his breath" by switching to free flow brought admonition from topside to cease "free flow" to allow the faulty compressor to attempt to restore the pressure.

This cycle was repeated over several hours while attempted to complete his task despite the inadequate helmet ventilation. We can only estimate how inadequate it might have been since the compressor often fell to 80 psi or below – well below the optimal pressure for proper helmet function – and we can only estimate what the effect of 300 feet of hose and a possible leak at the helmet attachment might have been.[157] Simulations in a hyperbaric chamber have shown that the ability of the regulator to deliver adequate air at low pressures is severely compromised, particularly at high flow demands such as maximum exertion or even panic.

In a situation such as this the diver adapts by altering his breathing pattern. He begins to take long, slow breaths in order to avoid "bottoming out" the regulator. This alternative is subtle and almost subconscious in the early stages, but unless the diver is completely at rest, carbon dioxide begins to accumulate in the body. This "waste gas", the exhaust from the body's metabolic engine, has very definite and deleterious effects: it begins to drive the respiratory control center in the brain, which, in turn, drives the respiratory "pump", the lungs, diaphragm, and chest to increase the air flow.

This drive can be consciously controlled to a degree: that's what happens when you hold your breath. But conscious control requires an intense concentration and alertness. These qualities are short-lived as CO2 accumulates in the body, since CO2 is a potent narcotic, dulling the senses while driving the respiratory pump to work ever harder. The harder the respiratory muscles are forced to work the more CO2 they produce.

As CO2 accumulates in the body, it also causes blood vessels in the skin and the brain to dilate and deliver more blood. Since had no hot water suit, only a wetsuit which flushed cold water over his skin as he moved about, the CO2 accumulation caused a rapid heat loss from the skin and the body's core, especially the brain. A cold brain cannot concentrate. Thinking becomes fuzzy and confused, and simple situations become complex and dangerous. hatchet slipped through the mat and the lanyard held him down. At another time it would have been a trivial entanglement, an

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157 based his analysis on the testimony arising out of the civil litigation. That testimony differs somewhat from the testimony adduced at the Coast Guard's formal hearing. At the hearing, testified that Compressor 2's gauge only dropped to about 90 psi. However, at the civil litigation and in dive log for the Rig 12 dive, evidence was developed to show that the pressure went lower. See FOF 42 and 54.