

Chapter One – Time Delayed Suicide

[The Floor of the Indian Ocean – The Enggano Excavation Site and Refinery - Exact Location Not Disclosed]

“I told you stupid sons of bitches that this was going to happen!”

The chime inside the phone vibrated, emitting a metallic tone as Jerry slammed the receiver down. Beads of sweat erupted from his brow and brain-stormed ideas raced through his mind as he tried to figure out what to do. The desk chair creaked as he leaned forward in thought, put his elbows on his knees and covered his face with his hands.

Jerry had tossed and turned all night when the operations manager told him the big-wigs in the Department of Energy wanted to increase production above one hundred percent. Mechanical equipment typically has extra capacity built into it, but no one knew the amount of overload that the refinery turbines could safely handle. Equipment that processed Rhodophyta (roe-do'-fa-ta) was still considered experimental and the seven installed in the Enggano refinery were the only ones in existence.

Jerry's boss had assigned him the task of leading a team of engineers, to figure out how far past one hundred percent they could safely be pushed. After a few months of breakdown testing and crunching numbers through a super computer, Jerry and the team of engineers had determined the turbines could handle eight percent more than their initial capacity rating. Most importantly, they could safely handle the overload without any short term or long term degradation to the device. Tests run above one hundred and eight percent provided inconclusive data as to the period of time the device could be safely operated.

As the senior representative of refinery engineering, Jerry hadn't been completely happy with the idea of rerating the turbines and had argued back and forth with the other members of the engineering team about the idea. Most engineers are conservative by nature and Jerry was no different. Running the rotating machines above their initial full load rating ate into the extra capacity that had been originally designed into them. But Jerry and his team had run through the numbers at least fifty times during testing and felt the extra eight percent was safe, but left absolutely no cushion for additional overload.

But when Jerry found out that the plant operations department had continued to increase the overload of the refining process past the additional eight percent, he had protested vehemently. Operations had increased the facility's output a few percent each day until they had reached one hundred and eighteen percent.

Jerry immediately notified his boss, the engineering division manager in Washington, of the situation. He begged him to tell the suits up top what was happening and that damage to the plant equipment as well as loss of human life was at risk if the amount of overload was not reduced. When his division manager told him that the directive to increase production had come through the Department

of Energy, and had been promoted by the *White House*, Jerry realized the die had been cast and there was nothing he could do.

Disbelief swirled in the pit of Jerry's stomach. He could not fathom how intelligent people couldn't understand cold hard facts. He knew that the numbers he had calculated were correct and it pissed him off that higher-ups—who had never even seen a Rhodophyta turbine or had a clue how it worked—were dictating how it should be operated. That evening after a few fingers of bourbon, Jerry set out to determine what he was going to do. After a sleepless night, he turned in his resignation letter the next day and began to make preparations to leave the underwater refinery.

Jerry had single handedly run the refinery engineering department for three years and had asked for little help from his co-workers at the surface. He loved all facets of engineering and had always graduated at the top of his classes. He'd received his under graduate degree in Mechanical Engineering from the University of Michigan and then both his Master's Degree in Chemical Engineering and PhD in Petroleum Engineering from M.I.T. He understood that once the chemical refining process of Rhodophyta was started, it could not be quickly shut off. It would take almost two weeks for a refinery of this size to safely spin down the chemical process. He also knew that if the load was not reduced at some point, at least one of the turbines would fail. A catastrophic failure would create an explosion with enough energy to destroy the entire refinery. Rhodophyta was a very volatile fuel and had an energy balance of ten point two, so when the place went up, there was going to be a very big bang.

The process for Jerry to travel from the ocean floor to the rig on the surface would take five full days. His body would have to slowly adjust to the pressure difference that existed between the Earth's surface and the underwater facility. Jerry would be placed into a decompression pod, which would slowly bring him from the refinery depth of more than eighteen thousand feet, back to the surface. The underwater pod was like a slow-moving aquatic elevator that shuttled workers between the rig on the surface and the refinery and excavation site below. If this decompression process was not followed correctly, or was reduced in length, the pressure difference would cause the human body to burst like an over-cooked sausage.

While Jerry was packing to leave in his personal quarters, he couldn't stop thinking about how short sighted and egotistical it was, for the big-wigs in Washington not to heed his warning and follow his recommendation to reduce the facility overload. He had painstakingly done the math. He knew his findings were correct and it ate at his insides to learn that when presented with the hard facts, Washington chose to ignore them.

As he ran the zipper along the edge of his suitcase, the telephone rang. He lifted the receiver and using a pissed-off tone blurted, "Speak."

"Jerry, this is Doug down in the operations control room. I've noticed a strange reading coming from one of the turbines and wanted to run it past you."

Jerry caught his breath as tension constricted his insides. "Abnormal? What do you mean by abnormal? I need numbers..."

"The data acquisition screen is showing a slightly above normal vibration coming from turbine number five."

Jerry closed his eyes and exhaled in frustration. He couldn't believe that the turbines were running into trouble already. "Numbers damn it! What's the accelerometer reading?" He said impatiently.

"It's bouncing back and forth between one and one point one. It's never done that before. It's normally about point nine or point eight."

Jerry clenched his jaw, anger flaring in his chest. He knew that if the turbines were to fail, the first indication would be an increased bearing vibration. He huffed out an annoyed breath and continued his questioning. "How long has it been like this?"

"Thirty to forty minutes... what do you think? Is it a problem?"

The information was starting to make his blood boil. Closing his eyes to do some mental calculations, he was constantly interrupted by the reoccurring message in his mind. *I knew this was gonna happen... I fuckin' told them it was gonna happen.*

If the abnormal vibration was due to the system overload, the failure had begun much sooner than any of the tests had suggested. Jerry wasn't in the habit of making mistakes and this turn of events had taken him completely by surprise.

Spit sprayed from his mouth when he shot out his next words. "You're running this fuckin' place ten percent above its maximum capacity, and when some of the equipment gives you an indication that it might be failing... you're asking if it's a problem? Are you really that fuckin' stupid?"

There was silence on the other end of the phone. Jerry took a few deep breaths to try and rein in his anger before he spoke again. "I'll get back to you." As he stood there with the receiver in his hand, his head pounded in synchronization with his heart.

Jerry took the phone and slammed the handset onto the desk. The vibration made pain shoot through the palm of his hand, but he continued to pound the receiver into the wooden desk, over and over again.

Each time he clubbed the desk, he spat out a single word.

Bang! "I!"

Bang! "Fuckin'!"

Bang! "Told!"

Bang! "You!"

The receiver splintered on the last blow and Jerry tossed it aside. The palm of his hand throbbed as he flopped into his desk chair, closed his eyes and tried to calm himself. He knew there was no way he could do any type of testing or calculations in his current state of mind.

After a minute or so, ideas about what could be happening started to swirl through his head. Deep in thought, his breathing returned to normal and his anger decreased to a more tepid level.

He realized that he might be overreacting. Five was experiencing an abnormal vibration, but maybe it was just a coincidence. Maybe it was nothing. A clogged lubrication line, or a dirty oil filter might cause a similar accelerometer reading. Jerry had given himself a bit of hope for the moment, but deep inside he still worried that the problem was connected to the extra overload.

Jerry turned to his personal computer and began to run equipment diagnostics to try and understand exactly what was going on. Jerry tore into the troubleshooting task like a rabid dog and as minutes turned into hours, he painstakingly went through engineering drawings and system data. After six hours of investigation, he had come to a conclusion.

He pushed the desk chair away from his computer monitor and stared at the data on the screen, while he chewed on a yellow number two pencil. Frustrated with his findings, he pulled the pencil from his mouth and threw it at the monitor. There was no clogged lubrication line or dirty oil filter. The extra overload which had been placed onto the system, had caused the needle bearing located in the front end-bell of turbine number five to overheat. From the data he'd collected, he had no idea how long the cylindrical rollers of the device would hold together. His prediction that one of the turbines would fail due to the overload was correct, but he was very surprised the breakdown was happening so quickly.

The muscles in Jerry's shoulders constricted and he tried to restrain the building anger, because he knew he would have to be the one to figure out a solution to the problem. He had no idea how long the worn bearing would last and he didn't want to waste a second of the precious time he had left, so he quickly left his quarters and headed toward the office. He alternated between a jog and a fast walk as he moved down the long well-lit hallway. The first item on his list was to contact his boss and arrange an emergency meeting with the department heads. He felt it was his duty to notify the managers of the situation and explain that the fifty-four people working at the Enggano excavation site and refinery were sitting on a ticking time-bomb, and no one knew when it would explode.

As he strode along the corridor of the refinery's main building, he felt a very slight tremor beneath his feet. He froze in his tracks as a bolt of fear shot through his body. He placed his hand on the wall, testing to see if he had really felt a vibration. But he felt nothing. He held his breath and listened intently, but heard only the same constant hum of the refinery that he normally heard, every second of every day.

Brushing the moment from his mind, he figured his imagination must be playing tricks on him. He remembered watching a scary horror movie alone as a child and then believing that every creaking noise the house made was a maniacal killer trying to break in.

He took a deep breath and exhaled before he continued to walk toward his office. But a few seconds later, he felt the vibration again. This time it was more severe and continued for a longer duration. Fear burned hot through Jerry's veins when he realized the shaking he experienced was not a result of his imagination working overtime, and he bolted down the hallway in a dead run. The tension increased with each running step as he drew closer to the office.

When he arrived at the small room he called his office, he pushed the door open and heard it slam against the wall. He slipped into the swivel chair in front of his desk and turned on the monitor. His fingers were a blur on the keyboard as he brought up operational statistics and diagnostic data for the turbines. He tilted his head back slightly, to adjust his bifocal lenses and get a clearer view of what was on the screen. Disbelief flooded his entire body when he realized that the vibration in number five had increased.

Jerry rubbed at his eyebrow, deep in thought. The data showed that the amount of vibration had increased by nearly twenty-five percent, when compared to what had been detected only eight hours earlier. He shook his head back and forth as the words swirled in his mind. *Not good... it's too high... too quickly... not good.* He grabbed a pencil from the cup on his desk and stuck it sideways into his mouth.

Jerry rested his elbows onto the worn armrests of the chair and steeped his hands in front of his face. On the end of his desk was a small plastic Christmas tree, which had a set of flashing colored lights wrapped around it. As he watched the string of LED's blink on and off, he remembered that yesterday had been Christmas day.

Growing up with a loving family in a rural part of Michigan, he had always loved Christmas as a child. The fancy holiday meal his mother would make, the smell of sugar cookies baking in the oven and the sensation of tree sap on his fingers were all memories that provided him with happiness and comfort. But as he began to realize his life was in grave danger, the thought that this might have been the last Christmas he would ever celebrate passed through his mind.

As he stared at the miniature Christmas tree, he felt the tremor again and immediately glanced toward the screen in front of him. The reading on number five had peaked at one point five G. A value that was unquestionably out of spec and definitely not good. He took a deep breath as the thoughts of Christmas in Michigan were replaced by feelings of fear and nervous stress.

The phone next to him began to ring. Jerry picked up the receiver, placed it to his ear and listened. "Jerry... what do you make of it?" It was the operations manager, Tom Cavanaugh calling to ask his advice on the situation.

Master Sergeant Thomas Cavanaugh was an ex-Marine; a large hulking man with a red broom moustache and flat top haircut to match. The two men had worked together for a while and had developed a mutual respect for one another. Even though Tom was not an engineer, Jerry trusted him because he had proven to be an excellent operations manager. Tom had worked at the facility from the beginning and knew every part of the refinery like the back of his hand. In turn, he trusted Jerry and

liked that he was able to take complex engineering topics and boil them down so any one could understand them.

Sweat began to bead on Jerry's forehead as he pulled the yellow pencil from his mouth and stuck it behind his ear. "It's number five. The front bearing has gotten worse. The reading has reached one point five... it's normally about zero point nine. I don't think it's gonna last much longer."

"Much longer? As in minutes? Hours?"

"I don't know... maybe a day? A day and a half at the most?"

"There's no way I can shut this place down in one day, Jer. Just getting us back to one hundred percent would take us eight or nine days." Jerry could hear Tom's frustration through the phone. "So even if we started cramming people into the decompression pod right now, odds are this thing would let loose before anybody could get to the surface... right?"

"Exactly... there is no way to run from this mess. The only way to save ourselves is to figure out some way to repair number five, or spin this place down before it craters."

Jerry shook his head in disgust, took the pencil from behind his ear and threw it on the desk. "I hope you realize that by running the turbines above a hundred and eight percent... you've killed us all." He couldn't believe that relatively smart people in such high positions could do such stupid things.

There was a pause on the other side of the line, before Tom's strained voice came through the receiver. "The orders came from up top, Jer... the guys at Homeland Security... they said it was a matter of national security." He sighed. "What else was I supposed to do?"

Jerry's mind spun in every direction as he focused on the words he'd heard from Tom's mouth. *National Security?... He'd heard about the mandate coming from the D.O.E... heard about the support coming from the White House... but no one had mentioned anything about National Security before... was it true? Tom had always been a straight shooter... why would he lie? Right now, who cared?*

Jerry reined in his disrupted thoughts, realizing priority had to be figuring out a way to fix this screwed up situation, if he was going to save this place, and save lives.

Jerry knew if there was anything a Marine could do, it was follow orders, and that was exactly what Master Sergeant Thomas Cavanaugh had done. The chain of command had ordered him to slowly increase production passed one hundred and eight percent—and he'd followed the order.

Jerry was losing his patience, and he shook his head and sneered into the receiver. "I don't know what you guys expect! You buy equipment from the lowest bidder and then abuse it and expect it to last forever. I warned everybody that something like this would happen if we ran above one hundred and eight percent." He chuckled nervously, like a man being lead to the gallows. "You knew the rerate left absolutely no room for additional overload... you knew it!"

Tom's voice cracked when he replied. "Okay Jerry... calm down pal. We gotta work together on this. Any thoughts on how to fix this mess?"

A grenade of rage exploded inside Jerry's heart. He shook his head in disbelief. "Yeah, here's a thought for you... kiss your ass goodbye because when that bearing seizes and number five locks up... this place is gonna crater. Crater! Can you even spell *crater* Tom?" Realizing his emotions were spiraling out of control, Jerry closed his eyes and took a deep breath, trying to rein in his anger.

Tom puffed out an irritated breath on the other end of the phone and shot his response back at Jerry. "Is that the best you got, pal? *Kiss your ass goodbye?* We need to come up with some constructive ideas, bud, and we need to do it right now. I don't want to die down here without trying everything possible... so get yourself under control, soldier."

The anger in Jerry's heart erupted like a volcano and he blasted out his next words. "I told you stupid sons of bitches that this was going to happen!" He slammed the receiver back into place and sat staring at the phone angrily.

He didn't want to hear Tom's questions. He didn't want to look at the vibration monitor. He didn't want to think about the worn bearing. And, like Tom, he didn't want to die. He just wanted to sit quietly for a few seconds, clear his mind and figure out what he had to do to save the facility and the lives of everyone onboard.

He leaned forward in the chair, rested his elbows on his knees and covered his face with his hands. *Was there any possible way to repair the damage to the bearing? Or replace it? Was there some way to spin the refinery down quicker? Was there some way to save the fifty-four people in the facility? Was there any possible way out of this situation?*

The rickety chair creaked when Jerry sat back and glanced at the equipment monitor. All seven of the turbines showed some degree of vibration on the accelerometer screen, but number five was definitely the worst. Every few minutes the monitoring sensor on number five would read one point five four G and move the needle into the red as a tremor shook the facility.

He thought about the testing and calculations he had performed at the lab in Sacramento. Jerry had always prided himself on providing work that was extremely accurate and statistically reliable and he knew his findings in Sacramento were correct. But none of that had any bearing on his immediate situation. He was sitting eighteen thousand feet underwater with a Rhodophyta turbine that had a worn needle bearing and he had to figure out some way to prevent it from failing and causing an explosion that would destroy the facility.

He closed his eyes and rubbed at his temples with his fingers. The stress had given him a pounding headache and a bit of a sour stomach, but he pushed those thoughts aside and continued to work on solving the riddle. Jerry had always liked how solutions to engineering problems were neat and tidy. When done properly, the numbers always added up and the conclusion always made sense. But there was one part of this situation that just didn't make sense to Jerry. His engineering team had run

breakdown tests on at least twenty-five turbines, using a variety of overload situations and none of them had failed this quickly. Not one.

A spark of an idea crossed his mind. Jerry quickly sat up erect as he pondered through the problem solving process. The spark smoldered for a few seconds before it grew into a small flame. A flash of hope and excitement flushed into Jerry's chest as the small idea grew into a raging inferno of possibility. *We ran numerous breakdown tests at the manufacturer's testing facility, ones that were far above one hundred and eighteen percent. Maybe number five is just an anomaly; maybe that bearing was marginal to begin with. We ran as high as one hundred and forty percent during testing and the turbine had lasted a little more than five days before it failed. Is there some way we can slowly unload number five and have the other six turbines compensate? We could take some load off the system by decreasing the flow density as well... it just might work.*

Excitement washed across Jerry's face as he opened the top drawer of the desk and grabbed his graphing calculator. The old gray metal desk vibrated like a cymbal when he slammed the drawer closed and he tossed the miniature electronic device onto the desktop. He stuck the yellow pencil—pockmarked by previous impressions from his molars—back into his mouth and began to do some math using the Texas Instruments DX315. He feverishly tapped at the buttons on the gadget, then pulled the saliva-covered pencil from his mouth and scribbled down some numbers on a note pad.

The muscles in his body contracted while he sat and stared at the numbers. He locked his eyes onto the digits, as if they were the pieces of a life-or-death mathematical brainteaser and sucked in a sharp breath. As the pieces of the puzzle began to come into focus, he tapped more numbers into the DX315. He hit the 'Equal' key and sat staring at the figure that had been calculated. The numbers one, and nine point six appeared on the display. Jerry performed a quick thought experiment to make sure his calculations made sense. Happy with his solution, Jerry pressed the pencil deeply against the paper and wrote down the numerals nineteen point six before he drew a slashing circle around them. He tossed the calculator and the pencil onto the desk and sat back in the chair. Relief coursed through Jerry's veins when he realized he had come up with a possible solution to the problem.

His calculations had determined that if they could push another nineteen point six percent through the six good turbines and reduce the combined flow density marginally, they could take number five off-line. The other six already showed some abnormal vibration, but nothing like five was experiencing. If the other turbines could withstand the overload and hold together for at least five days, the destruction of the facility could be averted, or at least delayed, and the facility could be safely evacuated.

Jerry grabbed the phone and tapped the numbers to call Tom, the operations manager.

The ex-Marine answered the phone and Jerry spoke quickly. "Tom... I think I've got it!"

"Got what?"

Jerry grabbed the pencil and circled the numbers on the pad again. "Nineteen point six!"

“What’s nineteen point six? Jer... slow down... what are you talkin’ about?”

Jerry tossed the pencil back on the desk, leaned forward and rubbed at his brow with his fingers. “If we can distribute the load on number five to the other six turbines and reduce the flow density to eighty-eight percent, we can take five offline.”

“Shut it down completely?”

Jerry answered enthusiastically. “Yep... completely.”

Tom was silent for a moment as he processed Jerry’s idea. Jerry could imagine his train of thought—Tom wouldn’t be thrilled with a plan that would put more overload onto other parts of the refinery system, but what other choice did he have?

With any situation in life, there were two choices; do something or do nothing. In this situation, doing nothing would definitely end in death and destruction. Doing something could still end in death and destruction; but there was also a chance it wouldn’t.

"Get your ass down to the control room and show us what to do!" Tom belched out the order in Marine fashion.