



## Sleep

Sleep on a submarine is more than just the necessary human condition of rest for the body; it is the epitome of the passage of creeping time. Such a delicious reward for one's labors does not come easy on a submarine; this too is a challenge of very unique conditions. And again it is very much different on a diesel submarine in comparison to a nuclear-powered submarine. Getting to sleep on a nuc falls far short of that in normal civilization, and getting to sleep on a diesel submarine is again that entire distance again from that on a nuc. A sailor on a nuc, lives in absolute luxury when going to sleep, compared to his shipmates slicked smooth with diesel fuel.

The conditions that I am about to describe are a function of purpose and scale. The diesel is a war machine first, that happens to need humans to function and without them would flounder in less than a day. A nuc on the other hand takes the human occupants along for a ride that could last years with the comfort and size that abundance can afford. Diesels need air, and without it, they would come to a halt. Nucs are unstoppable and food is brought along to make the excursion as long as possible for the sailors.

When a diesel leaves port it does so on diesel power. All the while it is charging the batteries. When the batteries are fully charged the engines may be shut down and the ship will run off the batteries for about 12 hours at a stretch. Then the cycle repeats over and over again.

The Nuc runs forever.

There are only a few things in common between the two vessels, one is the fact that they both are at sea; and that means they are both in constant motion. This fact the humans can get used to – but there are times when the status changes. It is during these changes that humans are reminded that during every breath they take – they are underway with all the pent-up momentum that that motion incurs, which also takes place during sleep. Sleep requires a space to lay down, and every bed on submarines are not covered with blankets or bedspreads. They are instead inside Flash-Covers.

The first thing you do when getting to your bed is to unzip the Flash-Cover and the last thing you do before you leave is to zip it back up. The Flash-Cover is intended to keep flammable material protected from catching on fire. Your mattress, your pillow, the pillow case, sheets and blanket are all inside the Flash-Cover. So, you unzip the Flash-Cover and roll it up length wise and jam it in between the outer bulkhead, or whatever is next to you and the mattress itself. There, rolled up it is somewhat of a shock absorber protecting you from being slammed into whatever it is along side of you.

The first habit most submarine sailors will develop is a hand on something solid. Not wrapped around a pillow, or clutching a blanket, nor comforting the face. The arm will be extended and in contact with something that is firmly attached to the hull of the ship. It could be a wall, a bunk pan, a chain, or a pipe. Anything firm and close by will do, such that the rest of the body can rest. Even in the soundest of sleeps possible the hand remains in contact with this point of reference, just in case. And what is that case? It is that moment in time when the boat changes from one status to another and the most common is a change of depth. If it is not a change of depth, then it is a change of direction. During a turn of any kind the boat will heel over to one side or the other and when asleep in your bed there is no way of knowing when this will happen or in what direction the “heel” will take place. Your body is just going to go with the flow and if you’re not hanging onto something and the change is radical enough you might just end up on the floor, and sometimes when you are in the top bunk that is more than a short distance away.

Another aspect of the diesel boat and motion is that a goodly amount of time is spent on the surface, getting from point A to point B. While on the surface you are subject to the state of the seas. The little round submarine is going to roll back and forth and heave to and fro with every passing wave. So again, if you’re not hanging onto something solid, you may just end up where you don’t want to be.

The second factor is not a habit, but it is a strong desire. That desire is exclusive to the diesel submarine. The desire is to sleep while running on the batteries, because trying to sleep while running the diesels is a debilitating activity.

Diesels as mentioned before need air. They take it in volumes of incredible proportions. Three engines with sixteen cylinders each and each cylinder being almost a foot across will suck the air out of every available space it can. With every rotation of the engine every cylinder will intake a volume of air equal to two-gallon jugs. That’s about 96 gallons of air eight hundred to one thousand times per minute. To give you a comparison that would be the entire contents of a two thousand square foot house completely emptied of all the air it had in a minute. Or put another way, if you were

standing in your front door and that amount of air was moving past you, you would be standing in the middle of a constant 45 mile per hour windstorm. It would take all your strength to stand up. Now then I have painted the extreme. Very rarely are all three engines running, the figures I just provided you with are for all three running. BUT to counter that “coming off the extreme”, I also used 800 to 1000RPM, which was idle RPM; and that was rare – but you get the point. Air is rare on occasion.

When the diesels are running and the ship is submerged it is breathing this air in via a snorkel mast, much like the one you would use in a backyard pool or swimming at the beach trying to see the fish below. The major difference is the size, and the fact that the shut-off valve works (most of the time). While traveling near the surface at periscope depth, the snorkel mast is rigged to allow the diesels to run. But on occasion a wave will come along that triggers the ball valve and that valve prevents the wave’s water from entering the boat.

BUT for that moment in time when the wave first triggers the ball valve and up until it completely passes the ball valve remains closed and the diesels take their air from inside the protected boat’s space. Unfortunately, the air in that space is the same air that is surrounding you. So, in an instant you are placed into an ever-increasing vacuum and the surrounding air pressure is reduced drastically. If you think you have problems with your ears popping in a slight change of altitude – try several ear pops within seconds.

NOW try to go to sleep while doing so. (I think I have made my point.)

As mentioned before sleeping on the Nuc is a huge distance in comfort factor from that on the Diesel boats. On the Nuc there is no snorkeling, and there is no travel on the surface so those two very common aspects go away. On a Nuc you can actually sleep without concern about the air you breathe with regard to the pressure changes and you don’t have to be worried about being pitched from your bed unexpectedly. But it’s still not your bed at home.

On both types of boat, your bed is called a “rack” for good reason. The “rack” is six foot two inches long. I am 6’4” so this was an issue but perhaps not for you. Next the rack above you is a short eight inches away from your nose when lying on your back. I had to make up my mind how I was going to sleep before I got into my rack. I had to decide to get in to lie on my back or lay on my stomach as I got in; there would be no changing my mind while in my bed, because there was not enough room to roll over once you were in bed. You may question that point, but remember the rack is enclosed with walls on 5 of the six sides of that rectangular box you are in. And the bottom and the top of that box are very close, remember from your nose when lying on your back the next rack up is just 8 inches away – your shoulders would have to scrunch a lot to be able to roll over.

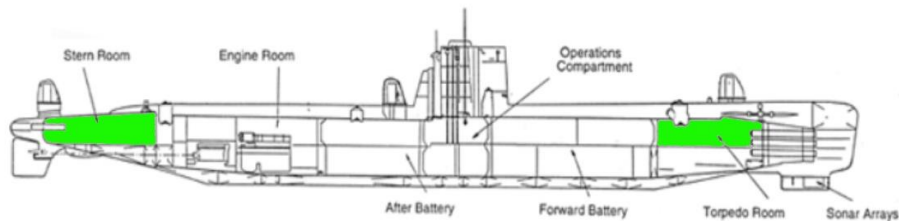
However, the Nuc’s do have some creature comforts not found on diesel boats. Each rack had its own ventilation duct. A little opening with a valve like that found above you on aircraft blows refreshingly cold air on your head. This is a very nice aspect if you are hot from exercising or working just before going to bed. But as your sleep period continues, and you cool off, that cold air will cause its own issues, which will most likely wake you up part way through your “night”.

Another creature comfort is a reading lamp. There is a very small fluorescent reading light just above your forehead on the ceiling of your box. This is a very big asset as it allows for some very relaxed reading before drifting off to sleep. However, there are

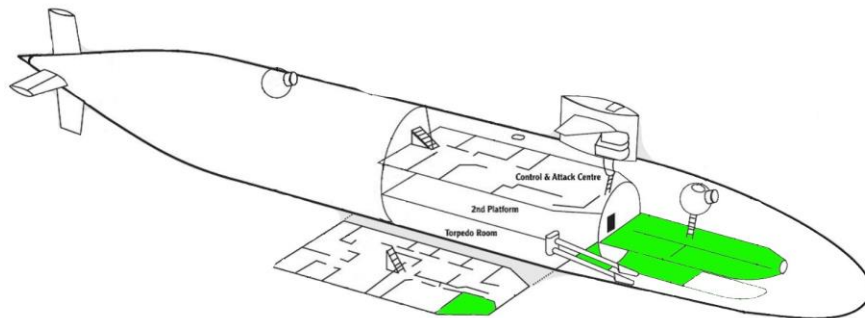
two downsides to this lamp. First there is a metal grill protecting the bulb of the light. If you wake up with a start at any time and jerk your head upwards in so doing, you are going to have the reading lamp grill imprint imbedded into your forehead for a long time. The other downside is the location of the on/off switch. It is always oriented towards the open side of the rack, and the person waking you up for your watch has a bad habit of reaching in and turning the light on to wake you up. As the fluorescent lamp blinks on and off coming to life – it inevitably wakes you up with a start; you guessed it, the imprint of the grill is your tattoo of the abrupt awakening.

So you can see that sleep on a submarine has its own set of challenges, but as you have noticed that most of the issues are centered on “getting to sleep” and “waking up from sleep”. Very little time was spent describing the actual “sleeping”. AND that is the greatest aspect of sleeping on the boats. You are unconscious! And time flies when you are unconscious. So sleep is very much desired over and above the wonderful recharging of your body that you also experience at home. Your time away from home while asleep on a boat passes quickly. I once spent 36 hours in my rack (in a boat sponsored contest) and it was delightful to cross off a day and a half off the calendar when I emerged.

The next aspect to consider about sleeping is where the bunk is located. I was an enlisted man in the Navy, and I will only discuss the “bunk rooms” for enlisted personal. The berthing for Officers is very much different, far more “comfortable”. Meaning that there are “extras” – for example that 8” of space above your nose, when laying on your back – Officers have 14”. Instead of 4 bunks high off the deck, two maybe three. Yeah, the Officers had it good. Shown here in green are the “spaces” where the enlisted men slept on the two classes of submarines that I rode. I slept in every space shown at one time or another in my 10 runs.



563 Class, USS Tang, Gudgeon, and Trout



637 Class, USS Puffer, Pogy, Pintado, Bluefish, Bergall, and the L. Mendel Rivers

I did not color the Torpedo Room on the 637 Class submarines, but they were also berthing spaces of sorts; they were “expansion” bunks, placed there when the need arose to accommodate larger numbers of crewmen than the normal compliment of 95 men. Note that the torpedo room was the normal berthing spaces for the 563 classes’ compliment of 75 men.

The sleeping compartments on the 563 class was easy, all the way forward or all the way aft. However, each compartment had its pluses and minuses. I will cover the forward torpedo room first.

The forward torpedo room was first and foremost the weapons delivery system. THAT took priority over sleeping. The forward torpedo room was always manned with a standing watch. Therefore, the lights were always on, and brightest all the way forward. So the immediate reaction was you wanted to sleep in the aft section, which was wrong. There was another issue there. All the way aft you were close to the access hatch, and the sink and commode. So aft you had to put up with people coming through the hatch constantly and using the facilities. Aluminum doors opening and closing to the commode was a constant distraction. To say nothing of the sink. The sink was a tip-up sink. A basin on hinges. There was no drain at the bottom. When you were done washing, or whatever it was that you were using the sink for, you drained it by tipping it up, and into its metal latch, such that the water drained out into a catch trough. Every step of which made a different sound. Sleeping in the aft racks had its drawbacks in the noise department.

Because all the racks were literally that, racks suspended on chains, they were easily and quickly stowed and moved out of the way in case weapons had to be moved around. You were literally hanging from the overhead with your bunk on chains. The two sets of chains closest to the center passageway shared the strain of all four racks hanging in sequence from top to bottom, but on individual links of chains. Whereas the outboard chains, they were individual to each rack.



So, if there was a weapon that needed to be moved, the racks that were in the way of that move could be taken out. The inset photo shows this exact case. Unfortunately, it does not show if the rack below the weapons was set up or stowed. But it does show the tie points for the rack that is not there. They are those metal brackets just below the guy’s pillow and forward. As a BTW that tow-loop on the nose of the weapon, that is about the level of the second rack from the top. When a weapon was in a movement position (ready to load the torpedo tubes), it would displace 8 bunks total: the middle two racks and four forward to aft. This meant that 16 guys would be “hot-racking” (two or more guys using the same bunk.) With all this information, you would think that sleeping in the forward torpedo room would NOT be favored after the aft berthing compartment. That is not the case.

You had a different set of circumstances in the after compartment. First and foremost was the fact that it was the more densely populated set of spaces. Did I mention that the showers on board were not used, because they were full of food, typically. But I digress. This story is about sleeping – or getting to sleep. The aft berthing compartment was as the name states AFT. It was at the back of the boat, you know where the rudder,

stern planes and screws were doing their thing. AND it was aft of the engine compartment and machinery room. The machinery room being where the electric drive motors and generators were located. One of the boats I was on had an issue with the power control panel. The break/no-break switches for propulsion were a little worn, and they would cause a rather large electrical arc. Now in a normal atmosphere that would be bad enough, but in a diesel submarine, you are constantly putting up with diesel fuel and other Petro-chemical fumes in the air. When you have that set of conditions a “fireball” was likely and common on this particular boat. So, in the late evening, around midnight; when the watches would actually be changing is when they would change the controls. They would change from the diesels not only driving the boat but charging the batteries as well; to a line up where they might even go to diesel direct, bypassing the motor / generator sets as well. At that point the switch would be changed, an arc would be created, and that arc would light the fumes, creating a fireball that would shoot across the machinery space, and it would ignite any rags mistakenly left out. Practically every night, there would be a “Fire in Machinery” alarm; and everybody would jump into action – including those who were asleep in the aft compartment. I was indeed sleeping in the aft compartment on that run. But I had the luxury of choosing when I went to sleep. So, I chose to NOT try to sleep during the evening watch or the mid-watch, essentially not sleeping at night, but during the day. I would have preferred to sleep in the forward torpedo room, as I had done on the other two boats in that class.

OH, and one more thing. I did sleep in the forward torpedo room on the other two boats, once in the aft portion of the compartment, and the other was forward, up by the mining table, where the watch stander was. I preferred the aft location, even with the entrance and commode issue over the forward position because the forward location is where the watch standers on that boat played chess on the mining table. One of the major reasons why I don’t like chess. I really grew to dislike the players announcing each move, while I was trying to sleep for a total of five months of my life.

I did get good sleep in the aft section of the compartment, even though that’s where I was during Typhoon Pamela. I was directly across from the sink in the story that is published on [Submarine Sailors dot Com](http://Submarine Sailors dot Com).

Now let’s talk about the Nucs (the 637 class boats). In the outline drawing you see six different compartments counting the uncolored Torpedo Room. They are called by the number of bunks, with the exception of three. There are:

6-Man	Main Berthing
18-Man	
22-Man	and Chiefs Quarters

The six man was great, except it was directly across from the main head with it’s four sets of sinks and four commodes. It also shared a wall with the two enlisted men’s showers and their aluminum doors and very loud water flow.

The eighteen man was perhaps the best, but during actual combat, it would have been bad as it was in between the torpedo tubes. In the drawing, this bunk space is hard to make out. It is on the lowest level of the boat, with no machinery anywhere around it.

The twenty-two man was a direct rival to the 18-Man, but it was only accessible by a ladder, that was surprisingly small. For someone my size, it was difficult to squeeze through the hatch, while on a ladder. Never-the-less, it had its own single commode, and

shower / sink area. If it were not for the access issue, it would have been my favorite of all spaces, because it was quiet and there was very little traffic. In an emergency it would have been a big issue.

The main berthing housed the bulk of the crew. If you do the math, you would think there were 49 bunks to be occupied – nope - 40. Let's just leave that description by itself, armed with the info that it is located above the diesel and the closest head was at a considerable distance.

Now true enough the Chief's quarters are totally separate, and me not being a "Chief", I never slept there. Typically, there were no more than 9 "Chiefs" so the total above is actually only 40, as up to 9 were Chiefs and they would be in the Chief's quarters.

I am going to end this description of "sleep", with a description of what you saw at the beginning. I'm referring to the picture of the officer either entering or exiting his rack in the officer's quarters. Note that the bunks are three high off the deck. This is not the case with the enlisted men's racks. They were four high. Note that in the officers' quarters the walls and ceiling are nicely finished. And two grab bars are added to the ceiling for ingress and egress. Also notice the green curtains covering each rack for privacy. On Diesel boats there were no curtains. In the enlisted spaces, there were no nicely finished walls or ceilings. Every section of wall and ceiling space were electrical, hydraulic or ballast piping systems. Those were your "grab bars", IF you were lucky enough for the top two racks of the four. Actually, the middle two racks were easy to get into and out of; but they were about elbow/shoulder height for the passers by and if there were two passing by at the same time, an elbow or shoulder would make it into the sleeping space of the crewman asleep in the racks on either side. The racks at floor level; well you could add in the likelihood of a misguided foot on occasion making it into your rack space. BUT that latter condition was not possible during the first half of your mission. One gallon food cans, four to a box occupied the floor space of all berthing compartments on the Nucs. They were all stacked neatly, two boxes deep and they would completely cover over the entrance to the rack. This meant that IF you had the bottom rack; you had to move four to six boxes of food out of the way to get into or out of your rack. Once in the rack you had to reach back out and move the boxes you had moved back into their first half of the run storage spaces. BUT this also meant that you were completely sealed inside your rack. No elbows, no shoulders, no passing conversations, and no errant feet disturbing you in the middle of your sleep.

I learned quickly, when assigned to a Nuc, that it was wise to volunteer for the stores handling party. IF I had a lower rack, I would "volunteer" to load the food into my berthing compartment to insure, that the most favorite canned food was stored outside of my rack. The faster it was used; the easier it was to get into and out of bed.  
Finally -

Once in your rack you could read for a bit. Preferably a hard cover book, as you could wedge them between your chest and the top of the rack leaving your hands free to turn the pages. Paperbacks would typically be too small for that and the print was too small to see when it was moving around due to your chest heaving with breathing. Once tired enough to attempt to sleep you would be lulled off to the melody of 400 cycle electrical hum, air conditioning air movement, and the distant sound of machinery running, and the occasional sound of valves opening or closing. Sweet Dreams.