TO THE NEW YORK TIMES
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FROM ROBERT TRUMBULL

REPAIR: II

PEARL HARBOR, Dec.18.(Passed by naval censor)---"First things first" was the rule that guided the vast industrial organization of the Pearl Harbor Navy Yard when it turned to as a unit to undo Dec. 7. The smoke had hardly cleared when the salvage and repair crews were swarming about the stricken vessels that were damaged the least, and thus could be made ready for battle in the shortest time.

It is a safe bet that the Pearl Harbor workers did not share unthinking criticisms, during the early months of the war, that the navy's first reports to the public on the Dec. 7 disaster were understated, if not actually evasive. As these men in overalls gazed at one-third of the heavy battle line sitting helpless in the harbor mud, they realized, if others did not, that to reveal the full extent of the damage then would have been an invitation to the Japs to return at once.

If that had happened, these skilled mechanics and artisans from every state might today be doing forced labor at Pearl Harbor for Admiral Yamamoto.

To one who has seen the havoc at Pearl Harbor Dec. 7, and has inspected the same navy yard a year later, these two facts completely justify the navy's cautious and vague announcements in December 1941:

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First, the actual enormity of the blow, which had to be kept from the navy's knowledge at any cost; second the accomplishment of the seemingly impossible repair job that the navy gave itself when it announced that certain ships were "damaged but capable of repair within a few weeks to a few months". It is Admiral Furlong's proud boast that the Pearl Harbor Navy Yard has made good that statement.

The one vessel, discounting the Utah, that is yet to be put in order is the Oklahoma, and the navy from the first has been completely frank regarding her.

Among the others, however, were the Nevada, the California and the West Virginia.

One of the experiences gained in patching, and in some cases raising, the smaller ships, there arose sound precedent for reclaiming the Nevada first among the battlewagons. She was less seriously wounded than the others, therefore would take less time to put back into condition. Yet she presented peculiar problems, necessitating invention of new techniques on the spot.

When the Japanese dived on her the morning of Dec. 7, the Nevada immediately got under way and headed for the open sea, her antiaircraft gun firing all the while. She left the Arizona behind in Battleship Row, sinking in flames and her torn hull filling with water fouled with her own oil.

The Japanese dive bombers, using converted 1,750-pound naval shells as missiles, pounded the Nevada's broad forward portion

to a confusion of rubble, mostly steel. The sheer weight of the Japanese bombs carried them through the ship's heavy steel decks. They exploded deep inside the hull, crushing the complex labyrinth of passageways, bulkheads and machinery into a churned mess of metal and miscellaneous debris.

"Bombs", Admiral Furlong told this writer and Keith Wheeler of the Chicago Times, "damage battleships but they do not sink them". Torpedoes do sink them, and one of these most feared of all naval weapons crashed into the Nevada's bilge compartments.

A ship, like a man, crumples under a blow beneath the belt. So the Nevada, then, was doomed--but only temporarily.

Her anti-aircraft crews still pouring steel at the constantly attacking Japanese planes, the Nevada was deliberately guided into shallow water. Her commander, Captain Francis W. Scanland, carefully grounded her on a point of mud where she would remain upright, and where she would not block the harbor to active vessels. There were many such examples, at Pearl Harbor that day, of such sound seamanship.

Thus the Nevada, when silence fell at the end of that morning, rested in a readily salvageable position, but her 29,000 tons dead weight, plus many thousands of additional tons of water now inside her, were pressing the vast machine down into the soft mud bottom.

Now the engineers, surveying the dead Nevada from the oily salvage barges, faced difficulties without precedent. The broad

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outlines of their task were apparent, however, as a result of their previous experience in floating smaller vessels. They knew at this time that the raising of the Nevada involved these steps, given in order:

First, removal of as much weight as possible from the vessel itself;

Second, sealing of breaches in the hull, to make her in effect a whole ship until permanent repairs could be made in the drydock;

Third, actual refloating of the vessel, which could be done only by pumping out enough of the water inside to restore the minimum ratio of weight for flotation;

Fourth, the delicate guiding of the helpless monster into the drydock, a job comparable to the moving of a badly-injured accident victim from pavement to stretcher without doing him further harm.

Fifth, the monumental labor of cleaning the ship throughout and making permanent repair and restoration throughout the floating city's hundreds of streets and byways.

The laymen can have no conception of the vast detail of planning behind such a comparatively simple operation as lifting off the Nevada's non-essential top structures to lighten her. She must be shored and braced, oil swept aside with water and air, conditions made workable for the cleanup gangs and the

cutters who would have to burn away the anchorings of the ponderous upperworks of fine steel.

There were mooring lines to fasten from the salvage barges, wood scaffoldings to erect for the men to walk on, rude accommodations to provide where the men might wash and eat without losing time. Back of it all were blueprints, requisitions, and the always troublesome chores of supply.

Finally the massive 250-ton floating crane was ready to hook onto the Nevada's removable top structures, whose great weight served no purpose now but to hamper the salvage experts in their primary problem of getting the ship's great hull afloat.

This great shipbuilding job finally accomplished, the second and much more difficult step in floating the Nevada was the sealing of the underwater punctures which had reduced the battleship from a vessel to an inert hulk.

Now it was up to the divers for a while. The Pearl Harbor Navy Yard employs a large and courageous crew of divers, some of them civilians famous in their field but most of them navy men trained in Hawaii. They are headed by Lt. Cmdr. H. E. Haynes When this rugged, graying officer talked to us in his upretentious office of the "temporary building" type, he had recently come from the hospital after an illness, to which, he insisted, the peculiar rigors of battleship salvage had only contributed.

Before any further steps could be taken on the raising of

the Nevada, it was necessary to tighten her throughout, to make her as nearly whole as possible before the temporary bandages went on the open wounds. This involved simply the closing of all bulkheads and watertight doors. But here again unprecedented difficulties arose.

The Pearl Harbor area where the Nevada sank was only 45 feet deep at the most, but the divers not only had to work under water they had to work under oil--a filthy black scum which closed out all light, so that the underwater operations had to be carried on in blackness. This added to the difficulties of cutting away twisted steel under water, a job which by itself Lt. Cmdr. Haynes' diver -mechanics could have taken in their stride.

So throughout the diving operations the divers worked in absolute darkness. But their task on the outside of the ship was easy compared to the job before them when they went inside the water-filled hull to close compartments.

The Nevada, it must be borne in mind, had not merely been sunk. Her honeycombed innerworks had been scrambled by high explosives. The walks, bulkheads, equipment large and small, every object there, down to the crew's clothing in their lockers, was all mixed together and masticated by the force of the blast.

Almost nothing aboard the Nevada was where it should have been. The diver, directed beforehand to a watertight door by study of the ship's plan, found that his path, when he got below,

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was not merely blocked; it was no path at all, only a procession of obstructions. Burst plates reached claws of jagged steel to hook the diver's life lines. Then, when he finally reached his objective, probably a door to open or a bolt to remove, his hardest work was usually to come. Many of the doors were fantastically jammed, the bolts squeezed into misshapen blobs of hard steel.

"We had to plan each dive before the diver went down", Lt. Cmdr. Haynes told Wheeler and me. "We plotted every step he was to make. Each operation was put at the end of a line of stations, and always these stations were within easy reach of each other--sometimes not more than five or ten feet apart.

"Every move the diver made down there was directed by telephone from the topside. If the least little thing went wrong, if he came across anything that didn't appear to be where it should be or if he were confused in any way, we summoned the diver back up at once, and went over the whole thing again.

"It's a good thing that the water wasn't deep", Lt. Cmdr. Haynes said, "As it was everything happened to us but the bends".

One bad thing that happened to everyone who worked on the sunken battleship was gas. The mixture of oil and water, plus putrid material of every category, yielded a hydrogen sulfide and carbon monoxide mixture of dire potency.

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"We didn't know about this", Admiral Furlong said, "until the men down in the Nevada began to keel over".

A single whiff of this lethal gas compound was enough to make a man collapse. A little more would be his death. Ensign A. Calhoun, assistant diving officer, told us about it from his personal experience. Ensign Calhoun, a graduate of the Washington Navy Yard's deep-diving school, is an extremely capable young officer recently commissioned from the warrant ranks.

"The gas smells like rotten eggs", he said, "And when you get a good dose of it you lose all will power. Sometimes you cry like a baby. You have no control over yourself at all".

To combat this prime menace, Admiral Furlong called in the yard's expert industrial medical section, headed by Dr. _____ Parker. They beat the problem after much practical research that involved no little personal risk.

First, Dr. Parker and his assistants went below themselves, wearing gas masks, carrying test tubes and a general assortment of chemical gear. They learned quickly what the gas was, and with the engineers, they speedily contrived a way to circumvent it.

They made a compressed air mask for the face, which resembles a gas mask in structure, but brings air in through a tube from compressed air reservoirs up on deck, instead of in directly through a filter. This gear will be described in more detail later, in the articles dealing with the Oklahoma, where Wheeler

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and I wore this mask when we went down into the hull.

So long as the divers were working in water, gas was a danger more potential than immediate. The threat to the underwater divers lay in the possibility that the gas would seep into their rubber suits and up through their helmets. Later, when the water was pumped from the flooded portions of the ship, gas became a prime hazard, and the workers below decks had to wear the compressed air mask at all times.

Onward from this early stage in the raising of the Nevada, the divers were given a complete physical checkup each morning. There were accidents, but not more than any contractor would expect on a job of such proportions. One of the clever expedient worked out by Dr. Parker's department was to feed each diver a quart of milk daily. This served two purposes: first, an hour below decks would leave a man completely dehydrated, and the liquid was needed: second, if a diver were so unlucky as to get gas in his system, the gas would quickly curdle the milk, and that would make the man vomit, thus immediately relieving him.

With the damage to the Nevada located, the engineer's first thought would be to build a cofferdam around it and repair the breaks in the hull. But a cofferdam completely around a battleship was beyond contemplation. From this difficulty there flowed the logical development of small cofferdams built to fit only around the holes to be closed. This was undertaken, but

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when the first ponderous patch was lowered into place, it did not fit properly onto the hull.

At this point of bafflement an even better idea was offered. The "patch" expedient was filed for future reference. It was later used, with spectacular results, in raising the California and the West Virginia.

It was discovered that the Nevada could be made watertight merely by sealing certain undamaged compartments, so that one or another of her inner "skins" became, at the damaged points, the actual supporting hull. In these portions of the ship the real hull would be carried along like a scab, with the watertight wall sealed behind doing the work.

The simple-sounding task of making inner compartments substitute for the outside hull required arduous labor. The stout hull's primary function is to push against the tremendous pressure of the sea. Therefore, before the water could be pumped from inside the Nevada, each watertight compartment that was to contact the sea outside had to be braced by a web of timbers so that it would not cave in under the enormous pressure. Of course all the materials and tools for this work had to be drawn down inside the ship through the mucky water, and the shoring installe in darkness.

At length, however, the great rotary pumps began to suck from the Nevada's interior the unmeasured weight of sea that was holding her down. As the tons of brine poured through the

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10-inch suction pipes and emptied overboard, the engineers battled the delicate problem of keeping the remaining water inside properly distributed.

"Free" water accumulated in any one section would be a great danger. Its uncontrolled waight, rushing to one side or another, might breach again the compartments so laboriously sealed, or might even capsize the ship.

Finally the 29,000-ton monster stirred like a prehistoric beast awakening in a swamp, and slowly she began to pull herself from the clinging mud. At last her keel was free, and the Nevada floated.

There are four historic dates in the life story of the USS Nevada. On Dec. 7, 1941, she was sunk by the Japanese. On Feb. 17, 1942, reclaimed, she entered drydock. On April 22, 1942, she sailed for the West Coast, again under her own power. The fourth great date, not yet to be revealed, is the day she first shot back at the Japs.