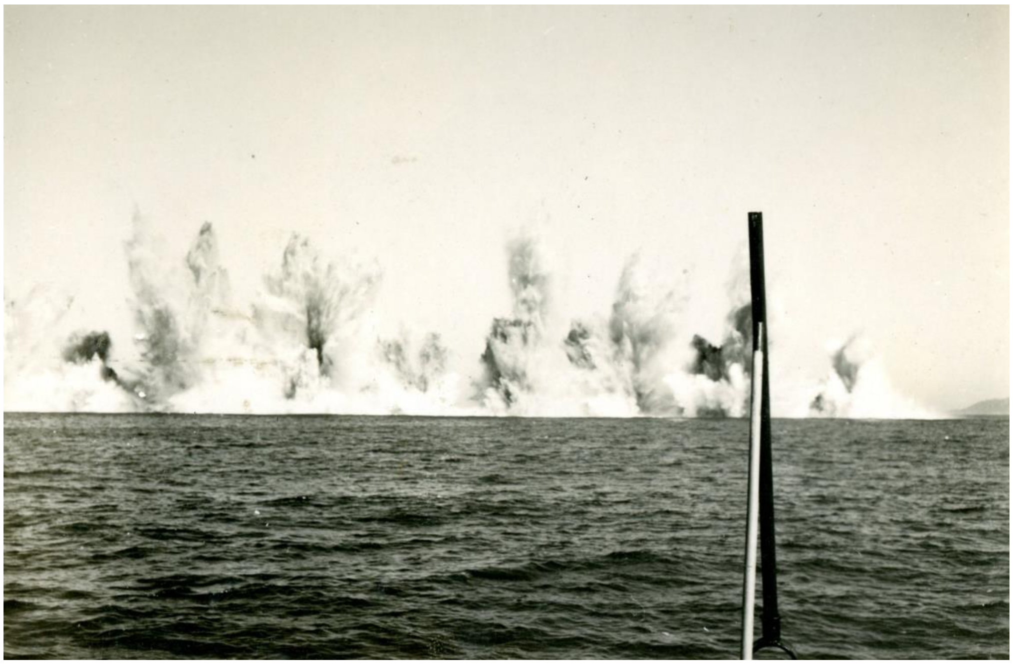
# SHE FIRED IN ANGER

## The story of the Controlled Minefield at Saldanha Bay 1942-1945

***By Dr H E J Symes***



*Explosion of loop 4 at the end of operations*

**PREFACE**

A descriptive account of all facets of the anti-submarine-controlled minefield which was laid across the wide entrance to Saldanha Bay during World War II has never been presented as a complete narrative. Only a few formal reports or isolated individual incidents have from time to time been mentioned in the local press or shown occasionally in contemporary wartime news reels. Such reports appeared mostly during the final years of the war and over the period immediately following it. The stories have nearly always been misquoted, disjointed, simply incorrect or out of context, the errors frequently persisting because they were never corrected. They have consequently contributed very little genuine information to the record of the Saldanha minefield.

It is intended that the following pages should try to assist the reader by putting in their original setting, the more significant wartime activities of the then newly-formed and, of necessity, little known mine laying and operating branch of the South African Naval Forces, in collaboration with the Royal Navy. The account covers the period from mid-1942 to the end of hostilities in August/September 1945.

At the time of writing, over half a century has elapsed since the events described actually took place. These are, fortunately, no longer restricted by the need for secrecy. More importantly, all the original controlled mining personnel who were directly involved are either aging or have already passed on. At least one is known to have lost his life in the intervening bush war in Rhodesia – now Zimbabwe.

For this reason, and also because in mid-1945 a general order was received in Saldanha that all confidential and secret papers and documents on file should immediately be destroyed by fire, there has been an even more compelling sense of urgency to preserve the story. The facts have now been put together by collecting whatever material could be gleaned from photographs (some of which were impounded during the war), fading memories, discussions and the fragmentary background information which might still be found in libraries and national archives. Fortunately, despite the instructions to the contrary, the writer was, unofficially, able to save a few selected papers from the incinerator since it was obvious that some of these documents would have considerable historic value in future post-war years when the veil of secrecy no longer applies. Selected papers in this category are now quoted fully in the following text.

The content and format of the record has been written for both the technical specialist in war studies, who will note that the systems used were restricted to the levels of technology developed before the early 1940's and the layman or casual reader seeking little more than entertaining information. The story thus covers subjects other than a simple factual description of what was done or what occurred. The wartime mining dramatis personae at Saldanha, on their part of the stage of momentous world events in the critical years 1942-5, provided the setting for a far more individual approach in several of the anecdotes recounted.

With this in mind, it has been necessary to try simultaneously to make the narrative both objective and interesting, which presents difficulties when recalling events in the third person. Hence, as far as possible the reader is invited to imagine himself personally involved with the mining party in their many interesting and unusual activities.

Due to the writer's changing circumstances in its early stages, the first draft was prepared in several widely separated parts of the world under greatly differing local conditions, a situation demanding much care to ensure authentic details. For example, sections were written in Johannesburg, Pretoria, Cape Town and Saldanha – this last to update the local content, despite the difficulty caused by the North Bay, Klipvlei and former mining establishment areas all now being built over or enclosed in the area of the present Defence Training facilities. Again, during a short holiday at the Kyle of Lochalsh on the west coast of Scotland the details of the events of June 1, 1944 were fittingly drafted on a heavily overcast, stormy, late winter day in the comfortable warmth of a wide-windowed hotel lounge built on a rocky promontory and overlooking the strait. The view presented was out through driving rain and sleet across a dark, foreboding, windswept, violently agitated running sea, towards the Isle of Skye while, further west, and partially obscured by mist, the smaller inner isles were just visible. In many ways the scene was reminiscent of the night of June 1, 1944 in Saldanha.

By contrast, a substantial part was written 'down-under' in the 40˚C plus summer heat, bush and dust of the harsh but unique Australian 'out-back' ('beyond the black stump', 'back of Bourke', 'in the sticks') surrounded by noisy, raucous, cackling kookaburras (laughing jackasses), while kangaroos browsed peacefully some distance away in the shade of the ubiquitous gum trees. All the while there was the accompaniment and torment of millions of the notorious, persistent, noisome and unforgettable Australian bush flies, these having to be endured without even the meagre protection afforded by a picturesque Australian broad-brimmed hat with its halo of swinging corks to ward off the flies. The writer, hot, ill-tempered and annoyed had to give the 'Australian Salute' continually with his free hand while attempting to work with the other.

The opportunity is taken to express appreciation to all persons and organisations for their assistance in assembling the necessary information. Deserving particular mention are the War Museum and Public Library in Johannesburg, the South African Defence Force Documentation Services in Pretoria, The Naval Museum in Cape Town and last, but not least, the remaining few original participants themselves, viz. the controlled mining and other naval personnel at Saldanha and the Cape during World War ll.

Special recognition is due to Miss Meg Laver, herself a member of the wartime Swans, for her suggestion, backed by persuasive encouragement that this long overdue work be undertaken and carried out.

One may hope that this collection of items will be an informative contribution to the South African War record, especially as it is the story of the only wartime group in the South African Naval Forces specifically engaged in designing, laying and operating a controlled minefield.

Finally, in looking at the photographs reproduced, the reader should remember that many of them were taken under wartime service conditions during the action depicted and more generally not posed for the camera.
*October 1991*

**PROLOGUE**

In the dimly lit control room, the silence seemed to emphasise the mounting tension and accentuate the air of expectancy which had been growing steadily during the last hour. Since the first warning indications had been given by the clear but unidentified signature from the outer guard loops no more alarm signals had been received.

Many high priority but brief telephone and radio calls to Naval HQ, harbour patrol ships and other local military defence units had been made. These included a request to the army for the search lights to be turned on in a further desperate attempt to identify the intruder. The inner and outer night patrol ships had been alerted to the nature of the emergency and warned to keep well clear of the delineated mined area and loops.

All personnel in the control room looked increasingly anxious; they seemed to expect the impending final alarm, wondering if the lapse into inactivity were merely the calm before the storm which, at any moment, might break suddenly into the violence of a sea of exploding mines.

And then slowly – very slowly – the spot of light on the screen which indicated an incoming signal from No. 5 mine loop began to move outwards from its normal position at the centre. It continued unhurriedly towards its maximum displacement near the end of the screen. There it stopped. It started to return, moving a little faster, towards the centre where it would complete the first half of a typical signature of a ship slowly crossing the loop.

Seated at the control desk and having already started the firing generator, adjusted the firing voltage and pulled out the selector switch for No. 5 mine loop with her left hand, Swan Sue Labuschagne gripped the firing lever at her right, all the while keeping her eyes fixed continuously on the screen. She then slowly turned her head a little towards the officer bending over the desk beside her. Quietly she asked him in her well-known, deep, pleasant voice, now obviously strained by the very serious turn of events: *'Must I fire, Sir?'*

Silent, worried and staring intently at the screen he hesitated for the few, long, remaining seconds before replying. Slowly the light spot continued to move relentlessly towards the firing point at the centre. In his mind he was rapidly trying to sum up all the possible, unpredictable, serious and far-reaching destructive consequences, both human and material, of the order he knew the circumstances demanded of him. His reply, when eventually given was a relief and seemed a mundane anti-climax. It certainly was not couched in conventional naval jargon but, the order was, nevertheless, clear brief and easy to obey.

It was simply: *'Okay, give it the works!'*

As the light spot moved across the centre line of the screen Sue pulled the firing lever. In doing so, she set off the biggest single explosion fired in anger against the enemy by any of the South African forces during World War ll. Her action made her the first woman ever to fire controlled mines and also again raised the old controversy of women in the fighting services being used in combat roles.

## INTRODUCTORY BACKGROUND

The year 1942 was significant in marking a crucial stage in the overall pattern of hostilities and in the position reached in World War ll, as it was being waged by both the Allies and the Axis powers. It is helpful briefly to review the war situation at that time to appreciate the reasons for the sudden rise in the importance of Saldanha from a quiet, little known fishing village to a vital link in the Allied war strategy.

The German blitzkrieg campaigns of 1940 and 1941 in Western Europe and in Russia had ended or had lost their early vigour and had reached their limits. Their concentrated attacks in the aerial Battle of Britain had not gained them the victory they had hoped for.

The contribution to the war by the Italians had never been of much more than of nuisance value. They had either failed in most of their objectives or had given the Allies points of weakness to attack. The Japanese incursions in widely separated parts of the Pacific theatre had exhausted their earlier advantages of surprise and momentum after their sudden first attack at Pearl Harbour on December 7, 1941 and initial successes such as the capture of Singapore and the sinking of the capital ships *Repulse* and *Prince of Wales*. Their forces being widely dispersed, they did not seem capable of further significant advances, especially after being checked and suffering heavy losses in the Battle of the Coral Sea in May 1942.

Thus, the broad war position in mid-1942 was more or less one of stalemate. The opposing forces were hammering at one another as hard as possible all over the world, endeavouring to gain some local superiority or warding off attacks in particular areas.

Apart from the approaching disastrous situation from which they were attempting to extricate themselves at Stalingrad and elsewhere on the Russian front, the Germans' effort at this stage was directed mainly towards continuing to bomb Britain, waging the to-and-fro desert war in North Africa and the unrelenting life-and-death struggle between the U-boats and Allied shipping in the Battle of the Atlantic. To exploit the latter campaign to its maximum and to extend their operations further afield, in mid-1942 the Germans introduced their 'U-cruiser', i.e. submarines of 1600 tonnes displacement whose operating range was reputedly 30 000 miles (or 50 000km).

By virtue of its geographic and strategic position about 100km north-west of Cape Town on the Atlantic coast, Saldanha became directly involved with two of these three war zones, viz. the Atlantic and North Africa. With German air superiority in the area and the threat of Italian naval forces prior to the decisive Battle of Cape Matapan, the Mediterranean route was far too hazardous to use as the main line of sea communication between Britain and Egypt. It was, however, necessary to supply the vital armaments to the allied land forces in Cyrenaica preparing finally to repulse the Germans in the Western Desert. Consequently, the very long and exposed strategic sea route around the Cape was used almost exclusively by the heavy traffic necessary to support the North African Campaign. In addition, the Cape was a natural point of convergence of shipping routes from Australia, India, Asia and the South Atlantic and Pacific around Cape Horn and the Falkland Islands.

It was their obvious strategy, therefore, for the Germans to concentrate a significant part of their U-boat onslaught at such a point of high shipping density and one of great importance to the Allied war effort.

By 1942 it was apparent that the concentration of ships on the route between the Cape and the North Atlantic war zone made it necessary that they should proceed together in convoys, each with an escort of one or more warships. All the ships comprising a single north-bound convoy normally did not arrive in Cape waters together, or simultaneously so that it became imperative to provide a safe temporary anchorage or haven for waiting vessels in which they would not be exposed to torpedo attacks. There were frequently as many as thirty ships assembled at a time awaiting their escort. Cape Town, even with its recently completed Duncan Dock, could not provide the handling assistance and anchorage facilities, nor, indeed, the necessary protection because the Table Bay roadstead was too open and exposed to defend effectively against long range torpedo runs. Also, at night the glow of city lights, despite a nominal blackout, could provide a background against which anchored ships would be silhouetted as a target, inviting attack.

The northern or Hoedjies Bay area of Saldanha had the largest and safest anchorage in South Africa which could be defended and in which ships required no extra assistance to move into or from their respective berths. In this respect Saldanha was probably the best convoy meeting point in the Southern Hemisphere, especially since ships were anchored on an open grid pattern for quick assembly and departure.

The bay had been known for centuries as an excellent harbour, but its earlier use and development had been restricted by the shortage of fresh water in the area. For the reasons outlined above, in 1942 the plan was implemented to make Saldanha the assembly and dispersal point for the South Atlantic Zone. South African Army engineers were consequently given the task of installing equipment to provide a pumped water supply from the Berg River, 30km to the east, as well as to mount big guns and searchlights commanding the entrance to the bay from the Atlantic.

The urgency to make Saldanha functional received an additional boost during a grim experience early in October 1942 when over forty ships, including the large liner *Orcades* with women and children on board, were sunk in the vicinity of the Cape in a period of about four days. This very grave time coincided with the introduction by the Germans of their new so-called 'wolf-pack' tactics in which several U-boats worked together to ambush ships and to carry out an attack. In the absence of an attendant German mother-ship, such an operation in Cape water required the long range submarines already mentioned – a noteworthy feature in relation to the abnormal events of June 1, 1944, which is the subject of the Prologue and is fully described in Section 10.

The underwater defences that were installed at Saldanha comprised an anti-submarine boom net and a controlled minefield. The net was made of many interlocking steel rings supported like a curtain from the surface of the water by a long horizontal wire rope and arranged to hang down towards the bottom. The supporting cable was held up at intervals by large cylindrical steel floats, supplemented by a number of smaller spherical buoys. The large floats were located and anchored by heavy rectangular concrete blocks placed on the sea bed. The net was laid on a line from Elands Point in the South, skirting the eastern side of Marcus Island and extended to Hoedjies Point, a total distance of about 4km. An entry gate was left in the boom about half way between Elands Point and Marcus Island. This was, of course, before the present causeway was constructed between Marcus Island and Hoedjies Point and prior to the installation of the iron ore loading facilities.

The difference between a controlled mine and the more widely known contact, magnetic or sonar types should be explained. While the latter three are actuated and fired automatically either by direct contact with, or the close proximity of a passing vessel, a controlled mine is fired manually as and when the accompanying detection equipment indicates the nearby presence of an unidentified and, presumably, hostile intruder. It is quite safe at all other times when no offensive action is expected to be taken.

From experience in other parts of the world, controlled minefields were known to provide reliable protection for anchorages against penetration by U-boats, such as unhappily occurred very early in the war when the *Royal Oak* was lost at Scapa Flow in this way.

As an interesting and surprising digression to what could happen, even indirectly, where anti-submarine detectors are <u>not</u> provided might be judged from the experience of Sydney, where the Australians opted to have no loops laid despite such additional protection being proffered by the Royal Navy. On May 31, 1942 three Japanese midget submarines successfully entered the famous harbour, penetrating the boom, firing on shore targets and torpedoing a ferry, much to the shocked dismay and consternation of the local populace.

To return to Saldanha, the mines with their detector loops were laid on their sea bed in a depth of water of about ten fathoms, in a line parallel to the boom and about half a kilometre further west towards the open sea, coming close to the western side of Marcus Island. They were in eight groups of twelve mines each in a generally north-south line. Any single group of twelve, or 'loop', could be fired electrically through a tail cable connector to the control station on the shore at North Bay. In a horizontal direction, the ends of each loop slightly overlapped neighbouring loops to ensure complete protective cover to the harbour anchorage

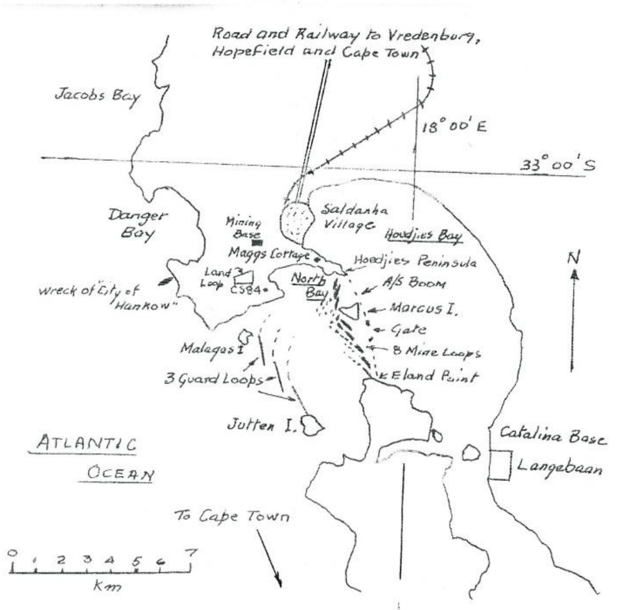



*Fig 1: Saldanha Bay minefield 1942-1945*

The defence system was supplemented by several searchlights at water level along the north shore of the harbour entrance between Malgas Island the North Island and, with the guns, were manned by military personnel. Some doubt was subsequently cast on the wisdom of mounting the lights at such a low level when they had to be used in the emergency of June 1, 1944, as is discussed in Section 10.

To correct misinformed statements to the contrary which did appear in the press after the war, particularly when referring to the events of June1, it must be stressed that no ASDICS or sonar detection systems were laid at Saldanha. The only other items were three long ‘guard’ loops, of exactly the same type as those laid with the mines, in about 15 fathoms and placed right across the entrance about 4km further west towards the open ocean, between Malgas and Jutten Islands and lying roughly parallel to the minefield. The purpose of these loops was to give advance warning of a possible intruder. The guard loops are also shown in *Fig 1*.

The urgent need to prepare Saldanha for the protection of shipping was again very clearly demonstrated while the field was being laid. The writer was on board the minelayer *Spindrift* waiting for a merchantman to pass into the harbour before starting to place a loop in position. As it went by, it was clearly seen that the whole of the stern down to the waterline had been blown away. Many other seriously damaged ships were seen at Saldanha during this period.

In passing, of further interest it might be mentioned that two of the world’s largest passenger ships of the time, the *Queen Mary* and the *Queen Elizabeth*, both used the defended anchorage at Saldanha during the war years.

The following pages give an account of the technicalities of the system, the planning and laying of the minefield, its operation and maintenance, functional organisation, the selection, training and welfare of the personnel, the eventual disposal of the field at the end of hostilities and a number of single anecdotes and events of interest which took place during the years 1942-1945. A separate publication is available relating to the SWANS in the SA Naval Forces. From April 1944 to the closure of the station in March 1945 SWANS were most successfully employed as watchkeepers, maintenance personnel and on clerical duties in controlled mining at Saldanha.

## TECHNICALITIES OF THE MINEFIELD

### Basic Principles

The controlled mining equipment at sea can be subdivided into two parts viz. a system to detect the presence of a ship and the mines themselves, including their firing at the correct time.

The detection of an intruder is based, firstly, on the fact that a steel vessel, because of its high magnetic ‘permeability’ or capacity to carry magnetism causes a change or distortion in the natural terrestrial magnetic field in its immediate vicinity. The change in the field conditions can be sensed by the very small voltage it generates in a multi-turn ‘search coil’ laid flat, ie. horizontally, on the sea bed where the depth is not too great. The signal is received and visually displayed at the control point ashore using a voltage sensitive instrument such as a galvanometer. A group of mines can then be fired manually at the correct time.

In the vicinity of the north and south magnetic poles the direction of the terrestrial magnetic field is generally perpendicular to the earth's surface. Between these points, ie. in equatorial regions, the field becomes horizontal or parallel to the earth's surface. Consequently, the magnetic flux or 'induction' passing through a horizontal coil on the sea bed is much greater at high latitudes than near the equator. Hence, the signal arising from this change in induction and given by a vessel passing over is stronger the greater the distance from the equator. It may also be noted that the polarity of the field, ie. its direction in passing in or out of the earth and so through the vessel, is reversed on crossing the equator. Saldanha lies between these limits at 33deg south, so that the magnetic field dips to the south at an angle.

There is also a second magnetic effect which is more important and independent of the vessel's position on the earth's surface. This is the built-in 'permanent' magnetism of the vessel itself. The ship then produces its own characteristic magnetic field in its immediate vicinity which causes a particular voltage signal or 'signature' in the search coil.

The actual signal from the vessel which is detected is thus due to the resultant combined field of both its permanent magnetism and the disturbed terrestrial field.

Hammering or beating steel while it lies in a magnetic field magnetises it permanently. Thus, permanent magnetism is acquired by a vessel during its construction as a result of shocks from riveting while lying on the stocks in the terrestrial field. Most of the vessels of the early war period were of riveted rather than welded construction and thus possessed a higher proportion of permanent magnetism. A ship's magnetism can thus be of any strength and polarity and lie in any direction relative to its longitudinal axis. These parameters then depend on the latitude and hemisphere of the shipyard and the vessel's orientation while being built.

If required, the magnetic characteristics of a ship can be changed, but not altogether eliminated by 'degaussing' ie. by the application of an artificial field by means of an electric current passing through coils mounted around the periphery of the ship, usually at main desk level. (The gauss is the unit of magnetic field strength, named after Karl Friederich Gauss, mathematician and physicist)

The extent of magnetic distortion, and hence the strength of the signal, diminishes with increasing distance between the vessel and the detecting coil. A search coil laid in deep water is thus less sensitive in detecting vessels on or near of the surface of the water than one at a shallow depth. At Saldanha the mine loops were laid in 10 to 12 fathoms and the guard loops further seaward in about 15 fathoms. The optimum depth would be the shallowest which would just allow a clear passage to surface vessels of maximum draught.

Wood ships or whales do not affect detection loops.

All indicator loops or coils were of 18-core cable, rubber insulated, with hard drawn steel armour wires and serving. Each core had seven tinned copper wires twisted together in six-over-one construction. The loop is laid on the sea bed in the shape of a straight, elongated rectangle, having heavy cylindrical sinkers or clumps at each of its four corners, the sinkers being held in their correct position on the cable by pairs of 'turks heads' made of light hemp rope *(Fig 3)*. The guard loops can be any length, three overlapping loops being used at Saldanha to screen the harbour entrance between Malgas and Jutten Islands.


*Fig 3: Locating the Turks heads and clamping puddings on electrical cables*

The two ends of the 18-core cable are brought together in a junction box to form an 18-turn coil by connecting the end of core 1 to the start of core 2, the end of 2 to the start of 3, etc. The two final ends, ie. the start of 1 and the end of 18, are then connected through the junction box to two cones of a 4-core 'tail' cable, the remaining two cones being used for the firing circuit. The tail cable is laid to the shore and connected to the detection and firing equipment in the control building.

To ensure their being in their correct position the mines are placed at regular intervals along the centre of the mine loops when the loops are being laid.

An operating problem experienced with the use of sea loops is that of 'perturbations'. These are spurious signals generated by either (a) part of the cable forming the loops swinging rhythmically in the swell across the terrestrial field, thus charging the inductance of the loop, or (b) magnetic disturbances in the terrestrial field itself caused by sunspot activity or lightning discharges.

Saldanha normally has a steady westerly swell of 12 to 15 seconds periodicity. Perturbations due to swell are, of course, worse in bad weather but can usually be recognised by the fact that all the loops are similarly affected in varying degrees, but the relative phase or turning of the signal displacements of the several loops is completely random.

On the other hand, perturbations originating from magnetic storms are easily distinguishable by all the loops giving identical spurious signals simultaneously because such disturbances take place over a very large area of the earth's surface. Also, magnetic storm disturbances are generally slow moving and present a single, synchronised swing of all loops on the galvanometer screen display, as compared with ship crossings or swell-induced signals.

The ability to distinguish between genuine signals and perturbations is therefore an important part of the training of a watchkeeper *(see Section 9).*
At Saldanha terrestrial magnetic disturbances were neutralised or cancelled by laying a 'land loop' around a large, level open piece of ground – a poppy-covered wheat field in peace time –

not crossed by roads where motor vehicles might generate signals. The loop consisted of standard 18-core cable, one, two or three cores being connected in ‘series opposition’ to the individual sea loops so that a zero nett signal was induced simultaneously at sea and on land by a magnetic disturbance, while not impairing the detection capability of the sea loops alone.

The horizontal area of the land loop, in square metres, was made 18 times that of a mine loop, so that the latter was balanced by only one turn of the land loop. Two or three turns were used to balance the longer guard locks. The 18-core land loop was thus able to balance all the loops of the minefield.

The shape of the loop was polygonal with straight sides so as to fit the natural horizontal contours between the surrounding hills. This method also made it possible to construct the loop accurately to its theoretically correct area. The accompanying survey work to locate the angular points was carried out by means of a ship’s sextant and plane table.

For security reasons, the loop was finally buried at a depth of about 30cm.

The land loop is shown in *Figs 1 and 4*.

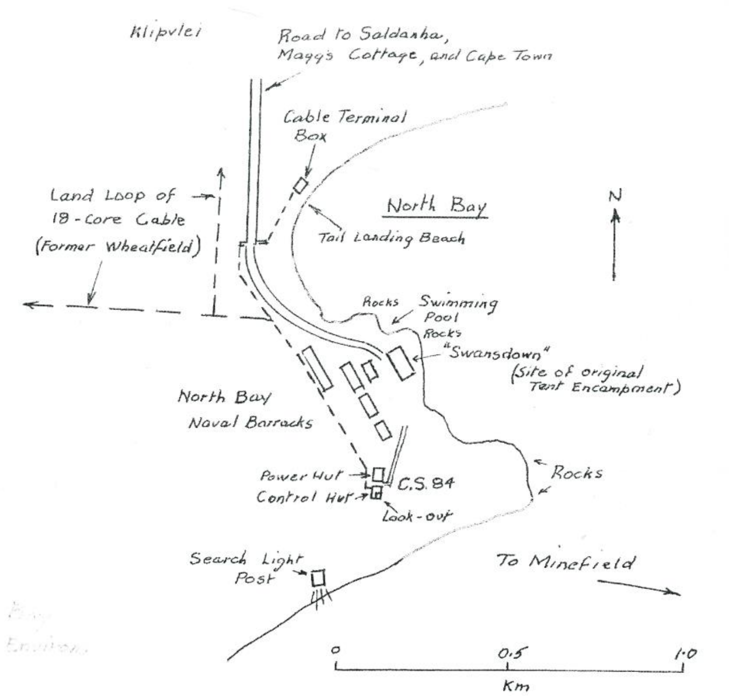



*Fig 4: CS84 North Bay Naval Barracks and environs*

## *Instrumentation*

It is theoretically possible to use two basic types of instrument to produce a signal using the electrical impulses from the detection loops, viz a fluxometer or a ballistic galvanometer. Both instruments have a moving element actuated by the signal current generated in the loop. The difference between the two types is the degree of mechanical control by a light spring applied to the movement to return it to the zero position when there is no incoming signal. The fluxometer has little or no spring control so that it tends to remain deflated in proportion to the magnetic change which has taken place through the sea loop. A limitation is that it gives an insufficiently clear indication of the correct point to fire the mines to ensure the maximum damage. It is also apparent that the instrument would be quite erratic during magnetic storms because of its tendency to 'drift'.

For this reason, the galvanometer is used in preference to the fluxmeter. It has spring control to return the movement to the neutral position where the incoming signal or perturbation occurs. Its deflection therefore measures the rate of change of magnetic flux through the detector loop, ie the voltage generated in the loop. The signature of a ship which the watchkeeper sees on the screen is typical of 'dipole' form between maximum right and left displacements. The correct firing point is at the central cross-over on the screen between the two swings *(Fig 5).*

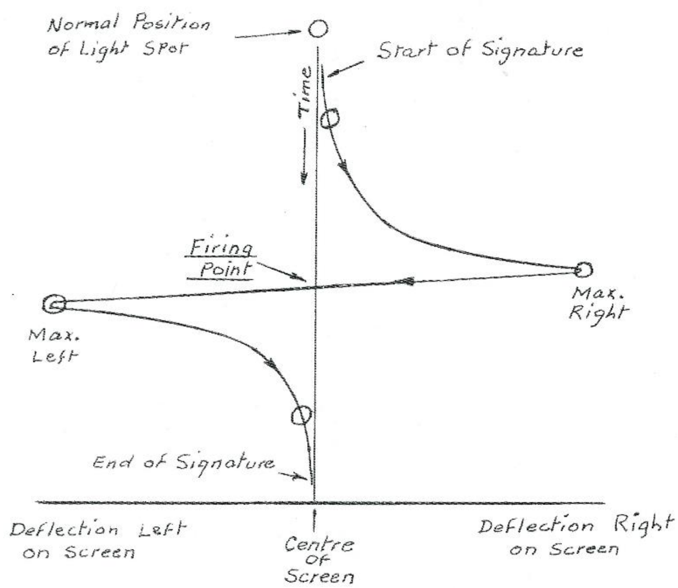



*Fig 5: Typical signature on galvanometer*

The galvanometer always returns to neutral immediately after a displacement caused by a magnetic storm even though the density and direction of the terrestrial magnetic field may remain abnormal for long periods.

Where ships cross the loops at ordinary speeds the full dipole signal requires about 30 to 60 seconds for its completion, the actual time depending on the speed and size of the ships.

To minimise the effect of extraneous ground vibrations the galvanometers are mounted on heavy shelves which, in turn, are carried on concrete columns whose footings are directly in the ground and independent of the floor and building foundations.

The galvanometer illuminating lamps are mounted behind the screen, their position being adjusted so that the eleven spots of light under calm conditions form a vertical line at the middle of the screen. Each spot is numbered on the objective lens on the projector lamp to indicate the mine or guard loop to which it is connected.

The distance from the screen and lamps to the galvanometer is about 5 meters. The sensitivity of the system is proportional to this distance *(Fig 6)*

*Fig 6: CS84 galvanometer and projector lamps*

The guard and mine loops and the galvanometer are connected to a terminal board in the control hut from which all tests on the sea loops can be made. Each loop is provided with a variable short resistor so that the sensitivity of detection can be adjusted and equalised between loops. Too high a sensitivity makes a loop and galvanometer too 'lively' to distinguish a genuine superimposed signal during a period of heavy perturbations. Maximum sensitivity is used during calm periods. Sensitivity is also adjusted for depth of water over the loops and is generally made greater for deep conditions.

It is important to note that detection circuits normally operate 'unearthed'. This allows them to continue working with one earth fault and permits a Varley loop test to be carried out.

*Amplifiers*

The galvanometers at the Saldanha control stations, CS84, were also provided with photo-voltaic amplifiers (PVA). In this system a small intermediate galvanometer, when actuated by a signal from its sea loop, reflects a light beam on to one or other of the two horizontally placed photo-cells which are then connected to the main galvanometer.

The system allows considerable amplification of the incoming signal from the sea loop but suffers from several drawbacks in practice. These are distortion of the true shape of the signatures, its greater sensitivity to perturbations, its inherent tendency to cause galvanometer 'drift' which requires frequent adjustment by the watchkeeper and additional skilled maintenance. The amplifiers can be seen on the top rack of the central desk in *Fig 7.*

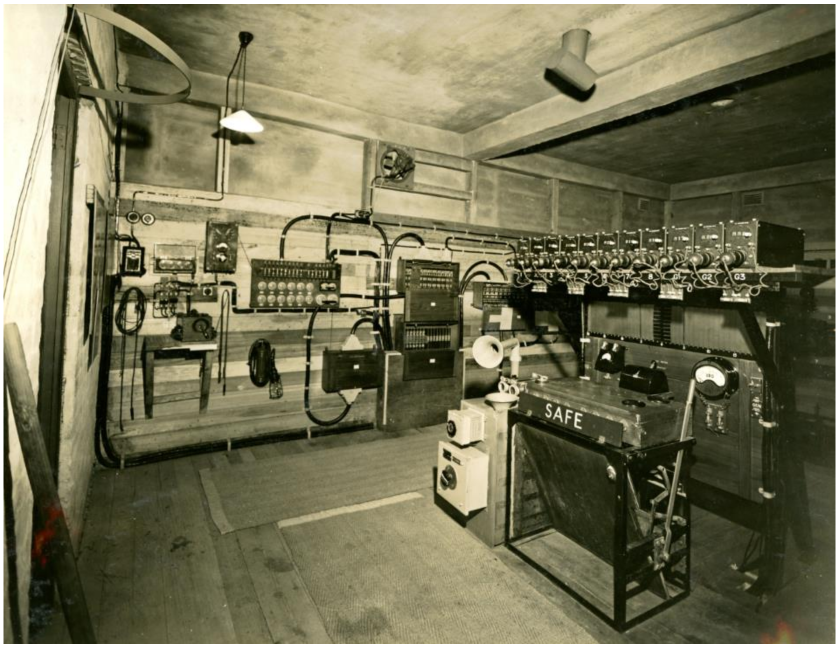



*Fig 7: Control Room of CS84*

For the above reasons the PVA amplifiers at Saldanha were used only during periods of very calm weather with little or no swell and where there were no terrestrial magnetic disturbances. Such conditions are exceptional rather than normal in south-western Cape waters.

The original decision to install the amplifiers at Saldanha was influenced mostly by the advent of the midget submarine which, because of its greatly reduced mass of steel together with its shorter ‘magnetic length’ required equipment which is much more sensitive. Fortunately, the Germans did not use these submarines in the area, nor was it considered likely that the Japanese would mount a campaign with midget submarines in the Cape theatre.

*<u>The Mines</u>*

Two types of mines are commonly employed in controlled minefields, viz. moored and ground units.

Moored mines are normally used in deeper water to ensure their proximity to the bottom of a ship passing over them. They are buoyant and must be anchored to a sinker on the bottom. A problem arises from their swing or displacement in tidal currents which are usually strong in the restricted channels where controlled mines are commonly laid. The correlation between their position and the indicator loops is thus less clearly defined when calling for accurate timing of the firing point.

Ground mines are laid directly on the bottom and are both suitable and necessary for shallow water. Firing can be accurately timed. The reflection of the explosions shock wave off the adjacent sea bed augments their destructive power.

At Saldanha ground mines of the LMk3 type were used *(See Fig 8).*

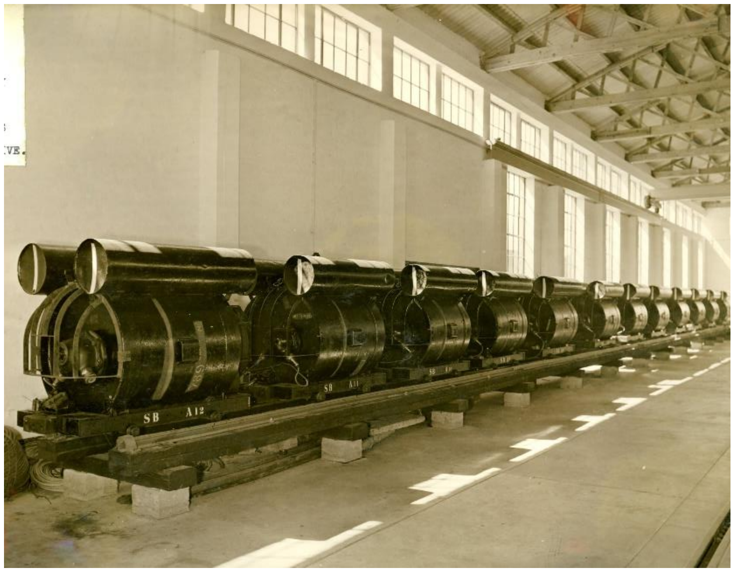


*Fig 8: A loop of 12 LMk3 mines ready for laying*

They consist of a main horizontal cylinder or tank fitted with lifting eyes and containing 1.5 tonnes of amatol (ie. TNT and ammonium nitrate), the primer and electrical detonator being screwed into a tube at the centre of one end. On the top of the main cylinder are mounted two buoyancy air tanks with small air escape holes. These ensure that the mine sinks to the sea bed in an upright position when laid. It then slowly loses its buoyancy as the air leaks out after it reaches its final depth. The tanks also prevent the mine rotating or rolling over during its descent and so possibly damaging the interconnecting cables coupling it to adjacent mines. The junction box for the incoming and outgoing electric firing cables is mounted with the primer and detonator. On the opposite end of the mine a length of cable to connect it directly to the next unit is freely coiled in an open crate on the base of the mine, permitting the cable to be pulled out one turn at a time. This length of cable allows a preceding mine to sink to the bottom before the next is launched from the slowly moving layer, ie. while waiting for its correct point of release to be reached. The extra length of cable provided between each pair of mines serves a further purpose, viz. to provide sufficient slack to allow a bight to be brought to the surface by means of a creep in the event of one of the adjacent mines requiring a future repair.

The electric detonators of all mines of the group – usually 12 – are connected in series. Shunt connected across each detonator and mounted in the junction box is a 6-ohm resistance coil which maintains the firing circuit electrically intact when the detonator bridges fuse on firing the mines but leaves the firing circuit with a slightly higher resistance as the detonator circuit is opened. In addition, each detonator has a short period pyrotechnic time delay to ensure that all the detonators of the group are ignited before the first mine explodes, thereby immediately and totally destroying the firing circuit. *Fig 9* shows the junction box with 6-ohm coil.

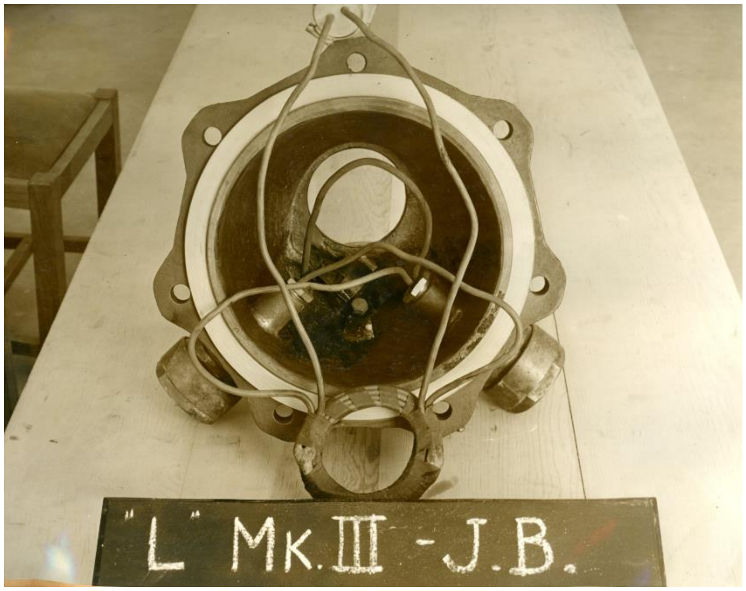



*Fig 9: Watertight junction box showing 6-ohm coil*

Ashore, in the control station, adjustable series resistors are permanently connected in the firing circuit of each mine group to ensure that all mine loops have circuits of equal total resistance, irrespective of their distance from the control point. All loops then receive the same correct firing current from the common generator source no matter which group is selected for firing. The correct firing current is 1.4 amperes.

The method of mechanically anchoring the firing cable to the mine is important because it provides the only means of raising the two-tonne mine to the surface of the sea in the event of repair work becoming necessary. The attachment is by clamping a 'pudding' to the base or mine sinker. A pudding is shown in *Fig 3* and consists of bending the end cable armour wires back around a conical ring or toroid and securing the wire ends to the body of the cable by seizing. The mine may then be lifted easily, the weight being carried while either still immersed in water or in air, by the cable armour wires which are of hard-drawn high-tensile steel. It can then be adequately and safely handled by putting several wrapping turns of the cable on the steam-driven capstan on the deck of the mine layer. In practice, the mine is brought to the surface where the buoyancy tanks are first allowed to drain *(Fig 10)* before it is raised clear of the water by means of the lifting eyes, and then lowered on the deck for repair or replacement.

The sinker or mine base is provided with four small, flanged rollers to fit the launching rails on the layer and to facilitate assembly and handling in the mining base or depot ship.

*Fig 10: Recovered mine suspended from derrick to allow buoyancy tanks to drain*

<u>*The Buildings and Shore-based Plant*</u>

Because the Saldanha minefield with its control equipment was regarded as a semi-permanent installation intended to last several years, the defence administration considered it necessary to provide durable protection for both operating personnel and the shore-based apparatus.

The decision was also influenced by the prevalent, persistent strong southerly winds throughout the summer months and stormy, wet and misty weather common during the winter. Added to these adverse factors was the important requirement that the area of the minefield should be under observation from the position from where it was controlled.

Hence, the site finally selected was on a raised and necessarily exposed hillside facing south-east, also, some quite usable, tough, rough, access road tracks were already available in the vicinity for bringing in materials and equipment. *(Fig 4)*

A further consideration was the proximity of the building site to the partially protected North Bay beach where it was proposed to bring all the cable tails ashore. In the interest of security, the length of tail cables ashore should be the minimum and in a position where they can be kept under supervision.

The two buildings comprising the control station became known officially as CS84 and were entirely of cast concrete construction as shown in *Fig 11*. One building housed all the power plant with maintenance equipment. The second contained the terminal boards for the sea circuits, galvanometer, text instruments, control desk, telephones, radio transmitter-receiver, officer's desk, telephone and observation post and ancillary equipment. Both buildings had built-in motor driven ventilating fans.

*Fig 11: CS84 Control and power huts looking west and showing outlook at left*

It can be seen from *Fig 12* that a special feature of the power building is the erection of the original complete power plant in its standard outdoor portable hut, as received from the RN to provide an entire self-contained unit accommodated inside the concrete building.

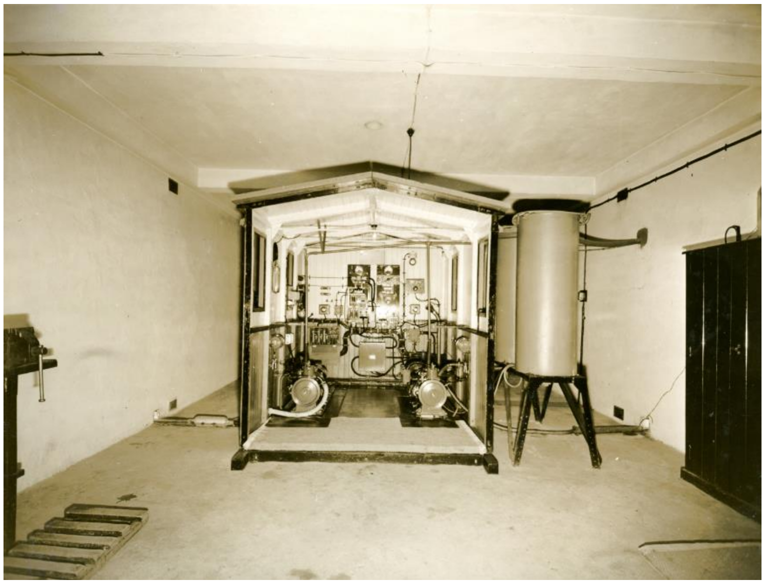


*Fig 12: Standard power hut enclosed in concrete building*

At a time when U-boat activity in Cape waters was at its height the decision to adopt this easy procedure proved to be expeditious. It allowed all the standard mountings for the components and pre-cut interconnecting cables to be installed quickly, exactly as supplied without alteration. The method permitted the immediate commissioning for use of the mine and guard loops as soon as they were laid.

During the period of two years during which it was in continuous service the installation proved completely satisfactory and, apart from routine maintenance, required practically no other work or changes.

*Power Supply and Control Desk*

As seen, the standard mining and control apparatus is designed as a portable, self-contained unit for quick installation and use in any remote area without any local facilities. For this reason, it is provided with its own power supply ready for instant service. It consists essentially of a lead plate battery with its associated fuses, switchgear and cabling. It provides low voltage illuminating power for the galvanometer projector lamps as well as input low voltage dc power to the motor generator set which supplies high voltage dc firing current to the mines. There is also a low voltage generator driven by a 3kw, lanyard started, Scott petrol engine used to charge the battery.

A second, similar petrol engine is mounted on the same bedplate with the motor-generator sets, to which it can be rapidly co-opted in an emergency for firing the mines in the event of the battery voltage being lower or its supply not available. In such an emergency, the coupling and starting of the stand-by petrol engine would have to be completed in the period between an intruder crossing a guard loop and his arrival at a mine loop.

The motor-generator, battery charging generator and petrol engines can be seen in *Fig 12*. The power system operates ‘unearthed’.

In the event of an alarm the firing generator is started by the watchkeeper seated at the desk operating the switch seen at the back of the desk in *Fig 7*. The availability of the correct firing voltage is then shown on the voltmeter at the back of the desk. The second voltmeter shown at the control desk indicates the availability of the battery supply. The firing voltage can be regulated by means of the hand rheostat showing on the left side of the desk in *Fig 7*.

The front of the desk has the eight selector switches for directing the firing current to the mine loop which the intruder is crossing, as indicated by the appropriate galvanometer. When the selector switch is operated, ie. the normal position when there is no alarm, the front board bearing the word SAFE is raised to shut off the selector switch handles. The board bears the word ACTIVE when it is hinged down to allow a selector switch to be pulled out.

In the photograph the galvanometer screen is at the back of the desk at the seated watchkeeper’s eye level. Above the screen is the shelf on which the PVA amplifiers are mounted. On the left of the desk are the two voice mikes allowing communication with the power hut and the telephone post look-out.

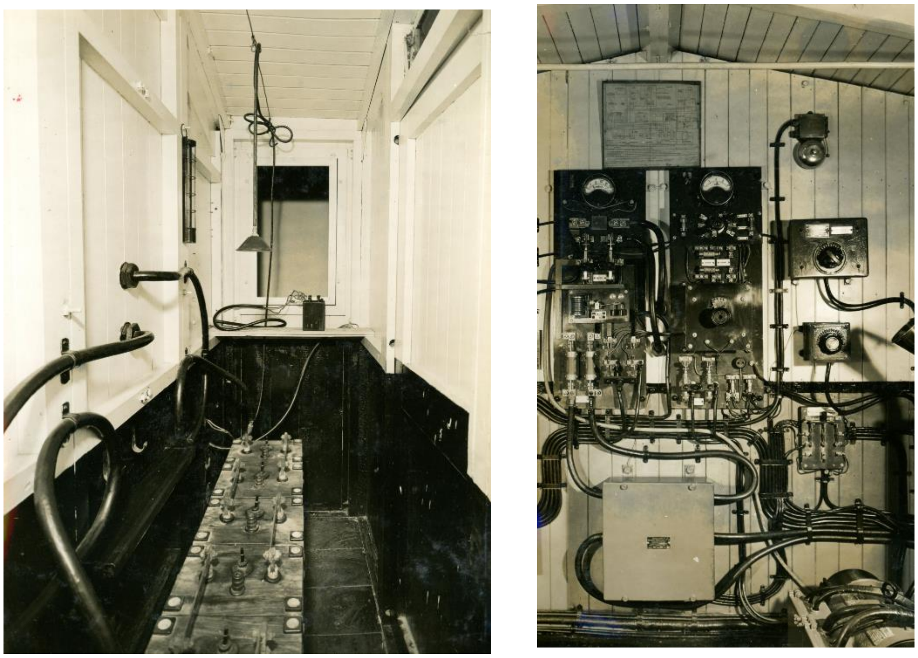


*Fig 13: Battery compartment of power hut*

**LAYING**

1. <u>General</u>
When the Saldanha controlled minefield was first being considered and planned the SANF had no equipment and no trained personnel capable of laying, maintaining and operating a highly specialised undertaking of this nature. Initially the entire prospect was under the direction of the RN up to the stage at which the field had been laid and commissioned. Thereafter it was intended that SANF personnel should take over and assume responsibility for subsequent operation and maintenance, including training of future recruits.

For this purpose, the RN provided two officers to liaise with the SANF viz. Lieut Cmdr Holmes RNR and Lieut Chapman RNVR, supported by an RN petty offer and crew experienced in the preparation, laying and testing of mine loops. The minelayer *Spindrift* – formerly a North Sea fishing trawler owned by the Germans, named Polaris and captured at Narvik, with bullet holes in her funnel resulting from an air attack – under command of Lieut Kerr, RNR and the totally manned base depot ship *Manchester City,* under the command of Capt Smythe, RN, containing all the stores required for the minefield, were the most important components of this early assistance.

The collaboration also included inter alia, the training of the first group of SANF mining personnel, among them the writer who was to be instructed as the SANF's first special branch technical Controlled Mining Officer, together with a number of South Africans of other ranks.

On the completion of the minefield at the end of March 1943 the *Manchester City* departed for duty elsewhere, while the *Spindrift*, which would thereafter be required for maintenance work on the field, was then brought under the direct control of the SANF and was commanded by Lieut Tanner, SANF, assisted by Midshipman Riddel.

2. <u>Basic Requirements of the Field</u>

Before the minefield could be designed and laid its more important requirements and practicality were carefully studied. The factors considered were:

a) It had to provide adequate protective cover for ships moored in the anchorage in the Hoedjies Bay basin at the northern end of Saldanha Bay. In other words, it should not be possible to make a periscope sighting and fire a torpedo into a group of ships from any position in the approach area without the intruder first having to cross the loops in the minefield. For Saldanha this meant that the mines should be placed to the west of a line drawn due south from Hoedjies Point, ie. roughly through Marcus Island to the headland, Elands Point, near the old whaling station on the south shore.

b) Using ground mines for the maximum reflected power from the explosion, the navigable depth of water over the mines should then be the minimum permissible, both to ensure reliable detection by the cable loops, especially because of the more recent introduction of midget submarines, and also to inflict the greatest damage on an intruder. Because of the gradually shoaling sea bed in the entrance area, becoming shallower from west to east, this required that the mines should be placed as close as possible to the above line south from Hoedjies Point. According to charts then available the depth in this area averaged about 10 fathoms.

c) The mines should be kept well clear of the adjacent defence boom with its outlying anchorages, also running south from Hoedjies Point. The clearance should be sufficient to permit unimpeded maintenance work to be freely carried out on both the boom and the minefield.

d) The sea bed should be level and sandy to ensure that the detection loop cable settles down and thus be free from perturbations or spurious signals caused by the prevailing heavy westerly swell. Also, a sandy bottom facilitates the use of a hooked creep with which to grapple and recover cables when maintenance work becomes necessary. Furthermore, a sand bed is less likely to damage the mines and cables in rough weather.

e) The sea bed should be level to ensure uniform sensitivity of detection at any point along the length of a loop.

f) The general line of all the mine loops should be as nearly as possible at right angles to the normal shipping lane to ensure maximum certainty and sensitivity of detection, based on the width of the loop as placed in position by the booms of the layer. It is apparent that locating the mines at right angles to the shipping channel also provides the greatest protective coverage for the minimum number of mines used.

g) The loops should be so placed that their cable tails can be adequately separated from one another and brought ashore on a convenient sandy beach en route to the control station. Tails brought ashore at right angles to the surf and on a sandy beach are likely to suffer only minimal damage in service.

h) The loops should be so positioned as to allow a number of survey transit beacons, already visible from the bridge of the *Spindrift* to be located in suitable places ashore and so enable the mines loops to be accurately laid in their intended and chartered positions.

i) It should be possible for the *Spindrift* to operate in reasonable safety in the positions chosen for the loops, bearing in mind the course and speed necessary to approach and depart from the loop sites and that these courses would be at right angles to the normal shipping lane.

j) Assuming that the first approximate positions for the line of mines have been determined from the above considerations, a provisional location for the guard loops can then be determined on the seaward side of the mine loops. The distance between the mines and the guard loops should be sufficient to give adequate warning, even in the event of an intruder attempting to break through to the anchorage at high speed. The distance is normally about 3km, so that at Saldanha this gives an initial position for the guard loops approximately on a line between Malgas and Jutten Islands, in a satisfactory depth of water of 15 fathoms.

k) The area of sea in which all loops are laid should be visible during daylight from the proposed control station ashore. From a study of the prevailing conditions at Saldanha along the above lines it was tentatively decided and later confirmed that the harbour could be satisfactorily protected by eight mine loops – the standard number for a controlled mining installation – of which seven would have twelve mines each and one, on the west side of Marcus Island, a special loop with sixteen mines. This loop, No.3, subsequently became known as *'Big Beatle'*.

The system of numbering used for the life of the field was 1 to 8 from north to south and G1, G2 and G3 for the three guard loops, also north to south.

3. *Check of the Sea bed*

Once the provisional positions for the mine loops had been decided it was then necessary to confirm the suitability of the sites for laying both the mines and the detection loops. For this purpose, the *Spindrif*t made several closely spaced parallel runs along the proposed lines of the loops, at the same time using the ship's recording echo sounder to scrutinise the nature and profile of the sea floor as well as the uniformity of the depth. In most of the sites tested the bed of the sea was found to be level and sandy, while the sounder also revealed a secondary reflective echo, coming from bed rock, at greater depth. As expected, some rough, rocky patches were revealed in the immediate vicinity of Marcus and Malgas Islands. The trace of the signal from the level, deeper rock can be clearly seen in the photo *(Fig 14)* which shows mining personnel examining this feature during the survey.

Correlation between the echo soundings and their exact position on the chart of the area was ensured by taking several pairs of simultaneous sextant readings from the *Spindrift's* bridge while making each survey run, using conspicuous landmarks ashore.

*Fig 14: Examining the profile of sea bed from echo sounder chart*

Particular attention was paid to the proposed landward ends of No's 1 and 8 mine loops and guard loops 1 and 3, to check both the navigability and also safe manoeuvrability in the restricted rocky and shoaling water in these areas. It can be noted that the control of the slowly-moving ships would, while laying, be seriously hampered by running out the electric cables under tension at the boom ends or over the head sheave.

Tidal conditions prevailing at the time of the echo soundings were noted on the recordings, especially for shallow water. Taking all these factors into account, the final position decided on for the centre of the controlled defensive systems was approximately 33deg.03 min south latitude, 17deg.58 min east longitude. The mines were on a north-south line, which was about four kilometres long between Hoedjies Point and Elands Point, skirting the western side of Marcus island. The average depth of water in which the ground mines were to be laid was about 10 fathoms.

4. <u>Fixing the Laying Beacons</u>
During the initial survey runs the opportunity was also taken to select suitable visible positions ashore for mounting transit beacons on the lines of the longitudinal axes of the loops.

This part of the operation might be explained further.

To ensure that the loops are laid exactly on their designated lines, for each loop a pair of markers or beacons are placed in suitable positions ashore, one behind the other, as far apart as possible, both being exactly on the line of the loop. The *Spindrift* may then steam on a straight course along the line of the beacons, either directly towards them or 180° away from them on a reciprocal course, until the position is reached where the first loop sinkers are dropped. This point on the transit line is indicated during the lay by setting on a sextant a previously calculated cut-off angle between the transit line and a conspicuous object ashore. This latter point is selected as nearly as possible at right angles to the transit line for the greatest accuracy. The start of the lay is then signalled when this angle is reached and laying is continued on the transit line until the whole loop has been dropped.

It is apparent that the two beacons should remain visible from the layer's bridge not only while it continues along the length of the loop but also for some initial distance on the approach run to the start point. This allows time to steady the ship's speed and course on the transit line and to correct for any tidal drift. In the confined ends of No's 1 and 8 mine loops different 'standing' starts were necessary.

The two areas chosen for most of the near and remote sets of beacons were, respectively, several positions in a line along the top of the Hoedjies peninsula and a point near the top of the small hill with conspicuous projecting rocks immediately behind Saldanha village, these two positions being about 1km apart, on a line of sight down to water level over the mines.

The exact orientation fixed for the loops was such as to allow the remote beacon on the Saldanha hill to be used for most of the loops without moving it, while a second single beacon served in each of the several near positions along the top of the Hoedjies peninsula. The method saved much valuable time at this juncture of the war as it required the construction of only two semi-portable beacons.

Mine loops 4 to 8 were thus laid on five lines radiating from the common centre on the Saldanha hill, but at different distances from this point with ends overlapping one another so as to give complete coverage across the harbour entrance.

Temporary shore beacons were also used along the top of the dunes fringing North Bay to run the tail cables ashore on adjacent parallel lines. This was to facilitate the recovery of any tail for repair work without disturbing its neighbours.

The beacons were of timber construction and consisted of a tall pole surmounted by either an upright or inverted equilateral triangle, adjustable in height so that the apices of the pair being viewed from the layer appear to point towards each other. The triangles were of open lattice type to minimise weight and wind resistance and painted white. The whole structure was stayed with wires in a vertical position, rocks being packed around the base for stability. This arrangement allowed both accurate siting and also frequent rapid changes of position while the layer was being re-rigged with the mines and cables for the next loop. The interval was usually about three days and was partly dependent on weather and visibility. For security, at no time were more than one pair of beacons visible from the vicinity of the harbour entrance. Immediately on the completion of the minefield these were also removed so as not to assist hostile observers by indicating accurately the direction of a mine group.

Both at sea and on land nautical sextants were employed for all measurement of angles used in the surveys. From these official secret working charts of the minefield were constructed. The well-established plane table methods were adopted for all land survey work in the area, both because the sextants were readily available and also the method expedited completion of the field. A very high degree of accuracy, as in land surveying, was not required.

5. Facilities for the preparation of mine loops

At the time of laying the original field, ie. during the first three months of 1943, at Saldanha there were no shore-based facilities whatsoever which could be used for the minelaying programme. The town itself consisted only of a little fishing village in the midst of a bare wheat growing area with two small hotels, the Saldanha and the Homestead, and a terminal railway station handling only light mixed traffic. This provided a link with the South African railway system, a facility which later was found to be very useful. There was also a gravel road to Cape Town meandering via Vredenburg village.

An essential requirement for the preparation of indicator and mine loops, before rigging all this field material on board the layer, is a large, clear level space under cover, protected from weather, provided with a security guard and facilities for personnel. Here the hundreds of metres of heavy, large diameter 18-core cable forming the complete detector loop must be laid out on a flat surface for measuring and marking all the significant positions along its length, as described earlier. Again, the firing circuit of the mines is progressively tested several times during the assembly of a group, so that a clear, open space is also required for this purpose. Eventually, the several lengths of firing cable have to be coiled into their crates on the mines and connected in series with neighbouring mines.

There was thus no alternative but to make use of the large depot ship *Manchester City* both as a store of base materials and also as a workshop for the assembly and preparation of the first eleven loops, ie. the eight mine and three guard loops. During this period the ship was anchored in Hoedjies Bay and had arrived initially loaded with her full stock of more than a hundred LMk3 fully charged ground mines in her hold. Understandably, she was placed in the most sheltered part of the bay in the anchorage protected by the Hoedjies peninsula. (The jetty below Magg's Cottage had not yet been constructed.)

In peace time the *Manchester City* was a merchant cargo ship engaged in the cattle trade between North America and Britain. The uppermost covered deck, running almost the full length of the vessel, originally was fitted out with several rows of cattle stalls. When the ship was taken over by the Royal Navy for mine laying duties the stalls were stripped out to leave a long unobstructed working space in which mines and cables could be spread out, assembled and tested. All the mines and the drums of cable were thus stored below the level of the working deck and consequently required hoisting facilities.

During their instruction and training period, which covered the preparation and laying of the original eleven loops, the first group of South African mine laying personnel, including the writer, were accommodated for several months with the RN mining crew on board the *Manchester City.*

6. Preparation of the detection loops

When the required length of 18-core detector loop cable has been calculated – usually in the range 1000-1500 metres depending on the number of mines in the loop or the length of the guard loop – this length is 'flaked' out, ie. zig-zagged or coiled flat on the working surface, in this case the deck.

Starting from one end of the cable, all the key positions along it are measured and marked, eg. turks heads are made of rope around the cable on either side of the four sinker positions to locate them and prevent their movement along the cable *(Fig 2).* The turks heads are painted in different colours so that the beginning and final ends of the loop and its port and starboard sides can be clearly distinguished when the cable is being rigged on board the layer. Also the release positions for all the mines of the groups are indicated by bands of coloured bunting bound to the cable with yarn seizing so that a mine may be dropped as each of these marks passes through the boom head during the lay. The positions of these markers must be calculated, making allowance for the previously determined depth of water and the approximate 45deg trailing angle between the cable and the surface of the water during the day. Puddings are made at both ends of the 18-core cable for clamping these cable ends to the junction box to ensure mechanical strength for laying or recovery.

The 36 ends of the eighteen rubber insulated cores are prepared for final jointing in the loop junction box to form the 18-turn coil. For each pair of ends being joined the rubber core insulation is cut back for about 10cms. About 7cms of the centre wire of the seven wire core is cut away; the remaining six wires are splayed out and the two cores are then brought together or 'married', so that alternate wires from the two core ends mesh with one another. The six wire ends of each core are then twisted neatly and tightly around the seven wires of the other core. This gives a very good electrical joint.

All the exposed wires of the junction are then re-insulated with pure rubber adhesive tape.

No solder is used to avoid the possibility of chemical action taking place. There is also no mechanical stress at the joint because all loading which might occur is carried by the puddings and armour wires.

The same procedure is followed at any straight junction boxes which may be necessary in long loops.

The complete loop is then tested electrically for both insulation between cores and cable armour and continuity between No's 1 and 18 cores, using a high voltage megger.

The loop is then ready for rigging on the layer.

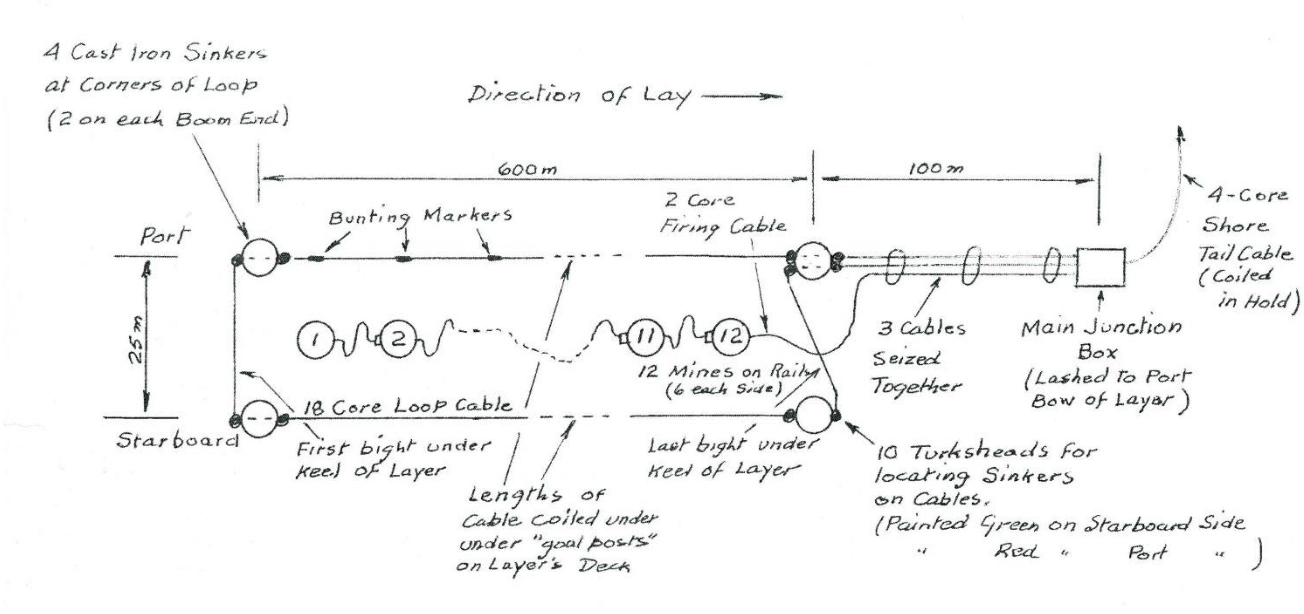



*Fig 2: Details of mine loop*

7. <u>Preparation of the mines and the firing circuit</u>

Mines were normally transported from overseas to the site of the minefield in a dismantled form, so that it was first necessary to re-assemble them. On the *Manchester City* the mine canisters, already containing their 1500kg charge of amatol, were brought up from the hold to the mining deck in groups of 12 or 16 as required for each loop. Here they were finally assembled by adding the sinkers, rail rollers, buoyancy tanks, junction boxes with 6-ohm shunt resister coils and crates of coiled inter-mine connecting cables. In the interest of safety, primers and detonators which were normally stored in the ship's magazine were left to last and were not screwed into the mine pockets until the layer was on its way to the site of the loop on the morning of the lay.

Each mine with its crate of cable is individually electrically tested for insulation and continuity using a high voltage megger, but at this stage the test obviously does not include the detonator fuse circuit, or the total completed mine firing circuit.

8. <u>Rigging the *Spindrift* for the lay</u>

For the reader to follow a detailed description of the method of rigging the ship with the mines and cables for a single loop, an explanation must be given of the many special features and fittings of the layer itself which are provided for this purpose. The systems of rigging the cable for laying the detection loop and the arrangement for launching the mines are dealt with separately. Then the apparently frantic but thoroughly rehearsed programme created by the many simultaneous activities on board the *Spindrift* during the actual lay will be better understood. In the description of the rigging procedure the opportunity is taken to explain the construction, function and operation of each component provided and used to lay the entire loop of mines in a single five minute run along the transit line.

9. <u>Rigging the detection loop and tail cable</u>

There are two booms, one on either side of the ship at the main deck rail level, each projecting about ten metres horizontally and at right angles to the side of the vessel. These are hinged at the point of attachment to the hull so that when not in use or when proceeding to the laying site they can be pulled in horizontally and secured against the side of the ship. They are permanently stayed vertically and temporarily, only while actually laying, in the fore and aft directions by means of shackled wire ropes.

On the top of the end of each boom is a large hoop for guiding the outgoing detection cable so as to maintain the width of the rectangular coil on the sea bed. These hoops are hinged and when rigging the ship, they can be opened to permit the insertion of cable blights. Photograph *Fig 15*, in which the seaman is facing the stern of the ship, shows the arrangement.

*Fig 15: First Starboard Sinker released from boom*

Under each boom head are a pair of eyes, one inboard and the other outboard, from which two of the four corner loop sinkers are slung by means of light hemp rope which, as each sinker is to be dropped, can quickly and easily be cut away with a sharp knife by the crew member sitting on the end of the boom. The photograph shows the first inboard loops sinker being cut away in this manner from the starboard side at the start of the lay, the remains of the rope sling still being attached to the sinker and visible.

In rigging the detection loop the common basic principle of ‘last on – first off’ applies. Thus, the last section of the loop to be laid, ie. the main loop junction box is first lashed to the outside of the rail on the port bow near the ship’s head. The two ends of the 18-core loop cable and the two-core mine firing cable enter it from the rear, relative to the ship’s direction. The four-core tail cable from the junction box is taken forward along the port side of the ship and then up and over the wide face sheave mounted centrally on the prow. It is then taken down into the forward hold where the entire length of the tail cable is coiled horizontally on the deck of the hold. The land on the controlling end of the tail is at the bottom of the coil, but a sufficient length of the cable end is left well clear of the main coil to allow it to be brought out of the hold and secured to a suitable sheltered and secluded part of the ship’s structure on the main deck. After the insulation has been stripped off the ends of the four cones this facilitates carrying out electrical megger tests on the whole cable system comprising the loop and tail. The tests include continuity and insulation on both the detection and firing circuits and are made frequently while the lay is in progress. Also, in these circumstances the electrical technician can work undisturbed on his tests and he is not being subjected to the general hustle and bustle of the many other distracting activities taking place all over the ship at this critical time. Furthermore, he is favourably placed to make an immediate report to the nearby mining officer should his tests show that an electrical fault has developed during the laying operation.

As the tail cable is usually several kilometres long there are commonly a number of straight-through junction boxes along its length. While coiling the cable in the hold all such boxes are looped out to the side, well away from the main body of the coil, to allow the turns to be stowed evenly. The possibility of the outgoing cable sliding across under a box and causing a disastrous tangle, to which the momentum of the moving ship contributes in no small measure to the magnitude of the mishap, is thus minimised.

As described in Section 9 on training, the rigging of the 18-core loop itself is best followed from photograph *Fig 16*, which shows the method of rigging the loop on a model of the layer. The model was built by the controlled mining personnel of the SANF at the mining base in Saldanha. It was used to instruct and then examine all new members of the mine laying crew in the rigging of a loop in the *Spindrift*. The advantage of this method of teaching was that each crew member was then quite familiar with every part of the operation and was thus capable of performing any of the variety of duties required by both the rigging of the ship and the subsequent laying of the loop.

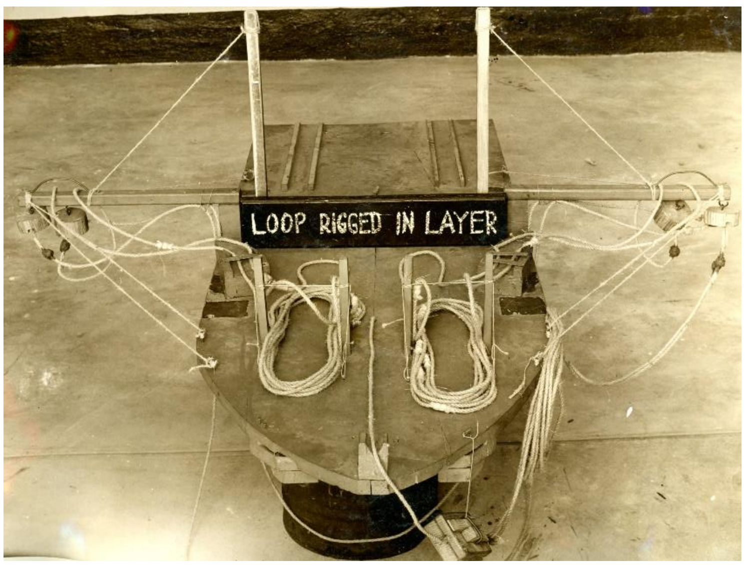



*Fig 16: Instructional Model for Rigging Cable on Layer*

In the model the loop junction box can be seen at the bottom of the photographs with the tail cable coming out of it and passing over the sheave and then into the hole. The two ends of the 18-core loop cable are laced together with yarn at intervals for about 100 metres from the box to be clamped in the loop corner sinker. This length of double cable is coiled up and lashed to the port side of the ship, as shown.

Beyond this sinker, the outboard one on the port side boom, the doubled loop cable splits into its two branches around the loop, one passing under the ship close up to the keel, thence to the outboard sinker on the starboard boom. This is normally done by passing the bight of cable between the two sinkers over the ship's stern and under the keel before clamping in the starboard sinker.

The remaining bight of the loop cable, over 1000 meters long, is then brought back from the two sinkers over the two booms in a forward direction through the end hoops in two additional bights and loops. Sufficient cable of these loops is pulled through from the free or slack side to pass over the two 'goal posts' on the forward deck as shown in the model. The remainder of the slack loop cable is then pulled in and coiled on the deck, beneath the 'goal posts', as shown. The length of cable in the two coils must be exactly equal to ensure that the loop is laid in the form of a true elongated rectangle. It will be recalled that the measured points on the cable have already been marked by turks heads. The fixed bight, ie. the first to be laid, is then also passed under the stern and clamped to the inner pair of port and starboard sinkers, the bight being pulled up close to the keel.

The four running cables passing up from the 'goal post' coils to the boom heads are then clipped under the port and starboard hand-controlled friction brakes, also shown on the model. These are timber-lined pressure levers to control the tension on the loop cable as it runs out. They also equalise the tension on the two sides of the ship, so as not to affect adversely its steering at the slow speed necessary for laying. The reader will also appreciate that the cable tends to run out more rapidly in deep water and constantly requires greater restraint.

The purpose of the 'goal posts' is to ensure that during the lay the off-going cable is lifted vertically from the coils and is not dragged off sideways and so probably cause a tangle with other turns. Nevertheless, great care is necessary where the final bights rise simultaneously from the deck to guide them on their passage through the brakes in which the friction layers must then be lifted well clear. If this is not done the outgoing bight of relatively stiff 18-core cable could easily get caught on any obstruction.

The fixed or standing side of each running bight is lightly secured with yarn at intervals to the wire rope which is the forward boom guy. This retains some degree of control after the cable leaves the brakes by 'peeling' off the guy as it breaks the lashings one at a time.

When all the loop cable has run out and its tension at the boom heads is seen to be increasing the pair of outer sinkers are cut free. This allows the doubled cable to the junction box to start breaking away from the side of the ship. Finally, the junction box itself is cut away, so that the only remaining connection with the loop is then via the tail cable over the head sheave.

In rigging the loop on the layer the following might be noted, together with some further comments:

(a) The 'last on - first off' principle applies at every stage.
(b) The two bights under the keel must not be slack or the slip stream of the ship's progress to the laying site and on the dummy run may cause them to slip astern and become entangled with the propeller. For this reason, the booms are located well forward on the ship's sides, but not ahead of the 'goal posts' on the forward deck.
(c) Because of the many coordinated operations involved, the reader will understand the necessity for carrying out the lay at reduced speed, but sufficient steerage must nevertheless be maintained.
(d) To assist steering and holding the course at slow speed the role of the operators in controlling the two brakes is important and requires both skill and awareness of existing conditions.

Referring to the model, it will be seen that the coil of loop cable under the goal post on the port side has the bunting band markers in position to indicate the mine release points as they pass through the boom head.

10. Rigging the mines and the firing cable

The total number of mines to be laid, ie. twelve or sixteen at Saldanha, is divided into two equal groups, half being mounted in tandem close together on each of the port and starboard launching rails, as near as possible to the launching doors at the stern as shown in the photograph *(Fig 17).*

*Fig 17: Mines on board Spindrift ready to be laid*

The starboard group of mines is launched first, starting with the unit closest to the door and is immediately followed by the mines on the port side in a similar order. As soon as the required number of mines is on board all the series cable connections between them are made by withdrawing some of the crated cable, but naturally omitting the primers and detonators until just before the lay. Continuity and insulation of the firing circuit are again checked by test as each plug-and-socket connection is made.

The length of cable between the last mine on the starboard side and the first mine on the port side is taken out through the starboard door, around the outside of the stern rail where it is lightly held by yarn and in through the port door to the first mine on that side. When so rigged there is the minimum possibility of a bight of cable getting caught on some obstruction while the launching process is being transferred from one side to the other.

Similarly, the firing cable from the last mine to be laid is taken out through the stern door on the port side, then on the outside around the post rail to the main loop junction box which, as already described, has been secured by yarn to the outside of the port bow.

The ship is then completely rigged and ready to lay a mine loop when the primers and detonators have been inserted and given a final complete loop electrical test.

## 11. Laying the loop

At this stage the reader should have an idea of what is involved in placing all the components of a complete mine loop in their correct positions on the sea bed without damage and in good working order.

At the outset it can be stated without hesitation that the most important single requirement for a successful lay is that every member of the mining team should understand his duty clearly and in detail and that there should be perfect coordination and collaboration between all members of the group. This applies at every level from the four officers on the bridge, ie. the commander responsible for navigation on the transit line, and the survey officer recording and providing angle data between himself and the two officers using sextants, down through the mining officer on the main deck who is the overall controller and signals the launch points for the mines and, finally, the petty officers responsible to the mining officer and in charge of the separate work parties on mines and cables. A mistake by a single individual could ruin the whole operation and might necessitate the complete recovery of the loop, causing many days, or even weeks, delay. Perfect training of all personnel, including safety precautions, is an absolute necessity.

On the day assigned to the lay the weather should be calm with good visibility from the loop site to all landmarks, the time of slack water between tidal flows must be known to minimise steerage difficulties and, preferably, there should be little or no wind. Where the starting ends of loops lie close inshore eg. loops 1 and 8, the lay must be timed to take place at the top of the tide for greatest depth of water coupled with minimum tidal current.

While the fully-rigged ship is proceeding to the site of the loop the two booms are moved into position and the primer and detonators are inserted into the mines which are then standing on the launching rails at the port and starboard doors at the stern of the ship. From this time on the high voltage testing megger must be locked away and only the safety megger *(Fig 18)* can thereafter be used for all electrical tests on both the firing circuit and detection loop.

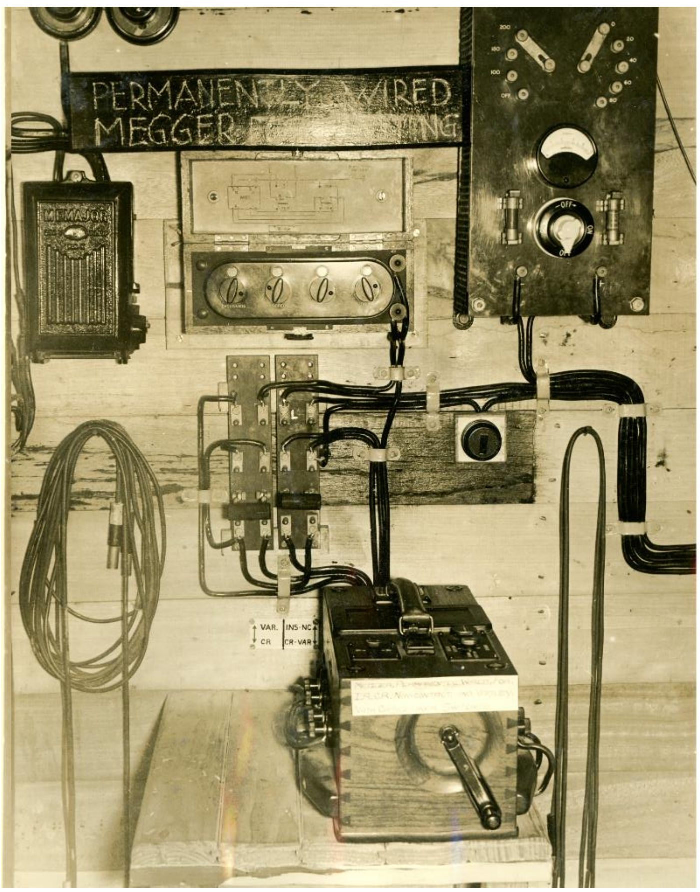



*Fig 118: CS84 Semi-permanently installed test equipment for insulation, continuity and Varley loop tests*

Before the first detonator is connected across its 6-ohm coil a continuity resistance measurement is made from the end of the four-core tail cable stored in the hold, but whose landward end has been brought out to the main deck from under the cable coil. As accuracy is now important to detect the difference with the addition of each detonator, continuity resistance measurement is done by the Wheatstone bridge method, using a variable resistance box.

The first detonator is then connected and the continuity resistance determination for the whole firing circuit is repeated. A small reduction in resistance indicates that the added shunt detonator circuit is intact. An insulation test on the firing circuit from the end of the tail is repeated to check the insulation of the detonator just added.

As each detonator is inserted in its mine the above two test are repeated so that any faulty conditions introduced by the most recent detonator can be detected and remedied immediately. The process is repeated until all the detonators are inserted and proved to be in good condition electrically.

The complete mine loop is then ready to be laid.

It is usual for the layer to arrive on site about half an hour before the scheduled time for the lay. This is to allow for a practice run to be made along the transit line to try to anticipate any navigational problems which may be encountered during the laying run, particularly because swirling vortex currents had previously been noted during the initial survey close inshore.

During this time the mine doors are opened at the ship's stern and the cable-laying signal is hoisted at the mast – two black balls with a white diamond between – to warn other ships to keep clear.

Where the beginning of the loop is some distance from the shore the layer proceeds at a slow speed on to the transit line, moving in the direction of the lay, until the starting point, ie. where the first pair of loop sinkers are dropped, is reached. This is to allow time and distance for the course on transit and the speed to be steadied. Where the beginning of the loop is close inshore, eg. loops 1 and 8 and guard loops 1 and 3, a standing start is necessary. This is difficult to do in practice because the ships must go astern to a point as close as possible to the shore, at the same time holding the head in the correct direction on the transit line. Immediately this position is reached, probably after more than one attempt, the laying run must be started at creep speed as any delay would then allow the ship to drift and yaw off course, especially as currents in such areas are quite unpredictable.

During this preliminary run-up the angle corresponding to the first loop sinker drop is set on one sextant. The officer with this instrument gives the initial warning order *'stand-by'* and then *'go'* to start the lay. In the case of a standing start this point may be reached almost immediately.

Just before the lay starts two mining crew members take up positions at the ends of the two cable booms, sitting astride them. They have sharp knives and are ready to free the first two sinkers on the order *'go'* by cutting through the seizing holding them to the booms.

The echo sounder is started and runs for the length of the loop.

From this instant for the next ten minutes or so the ship becomes a hive of activity. The operators on the two loops restraining brakes make continual adjustments, so that the cables from the boom heads following the first two sinkers enter the water at a trailing angle of about 45deg. The cables then continue to run out from the two coils under the 'goal posts'. The mining officer watches that the tension in the two cables is about equal; any inequality might send the ship off course at its slow laying speed. The mining officer also signals the launch of each mine by dropping a hand flag as each bunting marker on the loop cable passes through the boom head. The laying petty officer, on seeing the flag signal, releases the rail stop holding the mine back by means of a hand lever, allowing the crew to push it overboard with a grand splash *(Figs 19, 20, 21).* The petty officer then resets the rail stop to prevent the next mine following it overboard before its bunting marker on the loop cable appears.

*Fig 19: Mine launched from layer's stern*

*Fig 21: Mine hits water*

Fig 20: Mine falling

The process is repeated for each mine until all are laid, starting with those on the starboard side. As already seen, particular care is necessary when the last starboard mine goes to ensure that the interconnectivity cable to the first mine on the port side does not foul the ship's steelwork during the change from one side to the other.

When the end of the loop is reached all the cable under the 'goal posts' has run out and the last two bights pass through the braker where great care is needed to ensure that they do not catch on anything. The loop and bight then hang from the second pair of sinkers which are also cut free, the two loop cables then running from the port sinker to the loop junction box secured with seizing to the port side of the ship. The junction box also has the firing cable from the last mine and as these three cables take strain it, too, is cut free, thus leaving only the four-core tail cable passing from the port side of the ship over the head sheave, through fairleads and down into the cable hold.

During all this activity the commander is navigating on the shore beacons and ordering, through the bridge voice pipes, whatever steering and engine revolution adjustments may be necessary. The two sextant officers are taking several pairs of simultaneous angle readings along the length of the loop which they pass on to the survey officer to plot the final position of the loop and also to the operator on the echo sounder to mark the loop position along the profile of the sea bed. All the while electrical tests are being made on the four cores at the end of the tail to check the continuity and insulation of the detection and firing circuits.

The tail is then run out into the North Bay, navigating on the tail beacon.

As the tail landing position is approached at very slow speed a seaman in the bows is ‘swinging the lead’ and taking continuous soundings as a precaution against the possibility of the bottom shoaling suddenly, a common occurrence in the Saldanha Bay inlets.

The only remaining laying operation is to land the tail on the beach. For the Saldanha loops the landing position chosen was on the beach in North Bay. The exact route of the tail is also plotted at intervals by sextant, both for record purposes and to ensure that the several tails do not overrun one another, making any subsequent recovery more difficult. Sufficient cable is cut off in the *Spindrift’s* hold to ensure that the end reaches the terminal hut situated among the sand dunes on the shore. The end of the cable is finally cut to length for connection to the terminal board in the hut. The hut is connected by about 500 metres of multicore land cable to the control building at CS84 from where the last continuity and insulation test is made on both the detection and firing circuits. Based on these readings the required sensitivity of the detection loop is set on the adjustable resisters and the total resistors of the firing circuit is made equal to that of the other loops so that any one can be fired using the same generator voltage. The loop galvanometer is connected and adjusted.

Finally, the South African Naval Officer in charge, Saldanha and the Admiralty were advised that the loop had been commissioned and could henceforth be regarded as operational.

Laying a loop and commissioning it for service was normally accomplished between sunrise and sunset.

In the light of the intense and co-ordinated activity necessary for the few minutes during the lay it was to the great credit of all concerned that no faults, mishaps or accidents occurred while all eleven loops comprising the Saldanha minefield were being put down. There was, however, one incident which could have had serious consequences. This was while the *Spindrift* was landing a tail and was almost stationary in the middle of North Bay, with her head towards the beach. The required length of tail cable was in the process of being transferred to the dinghy for landing when suddenly the whole ship shuddered violently with an audible thump and simultaneously heeled over, while yawing slightly. In the slight swell the ship had settled on the top of a rock! Despite the risk of the newly-laid trailing cable snagging the propeller the engine was immediately put astern, the action succeeding in moving the ship out of danger away from the obstruction so that no second impact was felt. An immediate inspection of the bilges was ordered. Fortunately, it appeared that no damage had been done.

Later examination of the sea bed in this part of North Bay, by dragging a horizontal bar below the surface from a small boat revealed a submerged isolated pinnacle of rock on an otherwise a flat, sandy floor. It was certainly not shown on the navigational chart of North Bay being used at the time.

It might also be recalled that, in the midst of the consternation the incident caused, the two sextant officers again demonstrated their imperturbable sense of duty and training by calmly announcing that they had obtained a 'fix' on the obstruction and had recorded its position on the chart!

The whole laying programme was completed with only one minor interruption which was occasioned by the *Manchester City* running short of fresh water and general stores. This called for a day passage to Cape Town which might at first appear scarcely worth mentioning until some of the accompanying circumstances are taken into account.

For many months the ship had been lying at anchor in tropical harbours in different parts of the world without any maintenance. The underwater surface of the hull was heavily fouled with organic growth which reduced her best speed to a miserable five or six knots. Furthermore, her course lay through an area which was subject to U-boat attack at a time when such onslaught was at its height. The most dangerous single factor was her cargo of about 100 mines filled with high explosive and stowed in her holds below water level. A torpedo would, no doubt, have blown the whole ship to pieces.

Little wonder that all personnel not actually engaged in working the ship were required to remain on deck and wear life-jackets and helmets while scanning the sea for any sign of possible attack. Because they had no accommodation ashore in Saldanha, included in this group were the South African mine laying trainees, officer and ratings who, the writer can confirm were certainly very much relieved when the *Manchester City* eventually docked in Cape Town after its nine-hour 100km voyage from Saldanha.

A few days later the return trip was also successfully completed without incident under similar conditions.

Work on the laying of the field was then resumed and completed at the end of March 1943. On the day the last loop was laid, to celebrate the event, a convivial party was held in the wardroom of the *Manchester City.* To mark the occasion, the RN personnel presented the writer with a pair of mine-laying hand signal flags as being the first *'trained and qualified controlled mine laying officer of the SANF'.*

The South African mine-laying crew was by this time regarded as fully competent to carry out all future maintenance work on the field. They are shown in photo *no. 37* and, because of their unconventional working rig, subsequently became known as ‘the pirates’, a most fitting description when seen scrambling en masse aboard the *Spindrift* for a day of dirty work at sea.

*Fig 37: The mine-laying crew (‘The Pirates’)*

**6. THE MINING BASE**

When the *Manchester City* completed the assignment to lay the mines and loops of the Saldanha field they departed for similar duty in another part of the world. Saldanha was thus left with virtually no facilities for maintaining the field, ie. a large, open, level working area where the *Spindrift* could go alongside to rig and transfer mines and cables. It can be recalled that in mid-1943 the jetty into Hoedjies Bay had not yet been built. The wreck of the old German ship, *Prasident* lying on the shore line near the fish works had been concreted over just above the water line and was being used only for embarking or landing personnel.

*Fig 22: Mining base and instructional school, Klipvlei*

It was thus essential that the construction of the proposed mining base ashore be expedited. This was to be a spacious concrete framed, brick panelled building situated about a kilometre to the west of Saldanha village on a rough, existing vehicle track to Danger Bay on the west coast *(Fig 22)*. It was located so as to have standard gauge railway access from Saldanha station for the receipt of heavy mining materials consigned overland from Durban, where the main RN stores for mining equipment was located. It was also to be provided with a large outdoor area surfaced with concrete for loading, unloading, cleaning, painting and reconditioning recovered mines and cables under conditions free of the ever-present Saldanha wind-blown sand. *(Fig 23)*.

Fig 23: Recovered mines at base for renovation

Before the building could be completed and occupied and because of the delays always experienced with this type of work it was necessary to investigate what temporary arrangements could be made for servicing the minefield in the event of emergency laying or repair work having to be undertaken at short notice.

At this time it happened that a four-masted sailing ship, the *Commodore*, was lying at anchor in Hoedjies Bay, apparently for an indefinite period. Before the war this ship had already acquired some fame through it being used in the original (1935) film of *'Mutiny on the Bounty'* with Charles Laughton and Clark Gable. She had a long, open level deck with low side railing which, it seemed, could be used for at least some of our preparation of cables *(Fig 24)*. Also, *Spindrift* could tie up alongside in deep water for rigging.

*Fig 24: Commodore, Spindrift and boom maintenance ship in Hoedjies Bay*

The writer, therefore, made arrangements to go aboard the *Commodore* with Lieut Dolman to ascertain exactly what her facilities were and assess their suitability for laying out, marking, coiling and rigging loop cables. On going aboard from the *Golden Star*, a small diesel-powered launch which was used as an auxiliary to the spindrift, the ship appeared to be quite deserted and it felt as though we had stepped on to the deck of *the Flying Dutchman.* Looking around, it required very little imagination to visualise Captain Bligh and Mr Christian conversing together at the far end of the ship. The reverie was interrupted by the skipper suddenly appearing on deck and striding over to greet us. He was a grey-headed, tanned, elderly man and the only person living on the ship. In view of the fact that it was noon on a day which was hot, sunny, calm and quite windless, it was indeed surprising to see that he was dressed in a full outfit of black oilskins, gum-boots and sou-wester and smoking a strong-smelling pipe. Having recovered from our astonishment, we introduced ourselves and talked for a while, informing him of the reason for our visit. Muttering something about the sun and the yard-arm he suggested that we go below to discuss the subject over a measure of rum. The offer was accepted, mostly out of curiosity to see his living conditions and how such a ship was fitted out. Our conversation, stimulated by the rum, turned to a variety of extraneous topics including his vivid tales of rounding the Horn in stormy weather. We were left in no doubt of his obvious nostalgia for the good old days of sail.

We parted like good shipmates, but it never became necessary to use the *Commodore* because the construction of the mining base was completed before there was any emergency mining work to be done. This was fortunate for him as our heavily tarred cable would have wreaked havoc on his beautiful white holystoned deck.

The mining base building itself was rectangular in plan about fifty meters long, by fifteen wide, the long axis lying east-west. It was nearly ten metres high with an arched roof to accommodate a five-ton travelling gantry crane with a chain block hoisting unit, the crane serving the eastern half of the building with the incoming railway tracks.

This part of the building was also equipped with light rails for the mines along the north side wall, these being at a comfortable working height above the floor for fitting, preparing and testing for laying as shown in *Fig 25*.


*Fig 25: Electrical tests on assembled mines*

Outside along the south wall of the building was a long verandah for storing drums of cable *(Fig 26)*.

*Fig 26: Cables and buoys stored at mining base*

*Lookout at CS84*

The remainder of the building, ie. the western half and the southern part underneath the crane was left open and unobstructed for the preparation of cable loops. This work involved cutting long pieces of cable to their correct lengths, putting on all turks heads and puddings, painting them their correct colours and placing the red or green bunting markers to indicate the launching positions of the mines. Finally the cable had to be coiled up and transferred to the *Spindrift*.

Outside the northern wall was a small building, also of brick, containing offices and rooms with shutters on the windows for darkening purposes to accommodate the attack teacher for the training of watch keepers.

The last section of the mining base was the magazine. This was of standard construction with a generous surrounding bank or wall of earth and having rail track access. It was provided with a small portable crane for lifting mines. The accompanying *Figs 27 and 28* show the magazine and mines being handled inside.

*Fig 27:Explosives magazine at mining base*

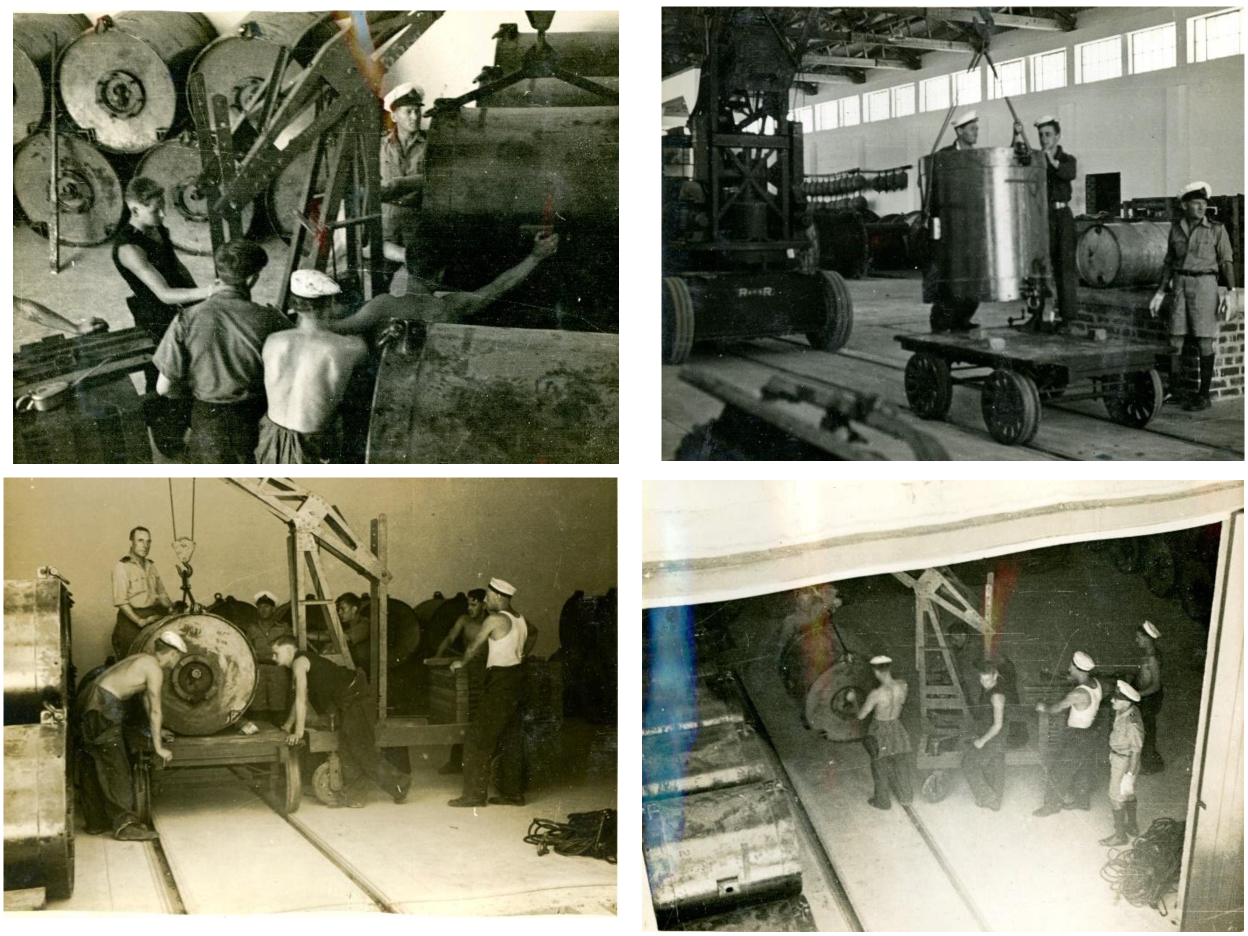


*Fig 28: Handling mines in the magazine*

In order to minimise the number of trained ratings employed in the base all unskilled labour, such as manhandling cable, was eventually carried out by Africans, with the exception of work on the mines and in the magazines. This led to an early incident which embarrassed the writer. Using his best ‘Fanakalo’ learned on the Rand gold mines he instructed the ‘boss-boy’ to move several newly arrived drums of cable to their final position against the verandah wall. After listening patiently to his instructions, the boss-boy turned to the gang and said in perfect English

*‘The officer wants us to place these cable drums in a single row against the wall, facing the outside!’* They calmly proceeded to do so. Needless to say, thereafter all orders were given in plain English.

During the time that the base was in use it was necessary on one occasion to transfer a consignment of about one hundred mines from the R.N. depot in Durban to the Saldanha base. This was to be by rail and necessitated a journey of several days via Ladysmith, Bloemfontein and De Aar. As there was a very strong anti-war element abroad at this time, particularly through the northern part of the route, special security measures had to be taken to safeguard the shipment. The train itself was made up of several bogies containing the mines which were covered with tarpaulins. At each end was a saloon sleeper to accommodate an armed guard. The departure and movement of the train was conducted with the minimum publicity and arrangements were made unofficially for a second pilot train to run immediately ahead of it over the whole route.

Fortunately, no incidents occurred and the mines arrived safely in Saldanha.

The administration of the base and the work conducted there eventually was the responsibility of the writer in his capacity of Mining Officer.

## 7. TESTS AND MAINTENANCE

<u>1. Routine Tests</u>

When the minefield had been completed and commissioned it was obviously of the greatest importance that thereafter it be maintained in continuous working order so as to be available at any time for its primary purpose, ie. the protection of assembling and dispersing convoys. Apart from the loop which was fired operationally on June 1, 1944, as described later, it can be recorded with no little satisfaction that the field always remained fully functional without interruption during its entire period in service. To achieve this reliability required routine testing as well as occasional special tests to prove that it would have performed satisfactorily in the event of hostile submarines attempting any clandestine entry into the harbour.

The following is an account of the routine and special tests which were carried out and the various facets of the maintenance work which became necessary during the 26 months the field was in service.

Reports on all regular tests were submitted to the SANF and the Admiralty once a month. Special tests were reported separately as they took place.

Equipment checks included the lead plate battery housed in open glass jars and providing all the normal running power for the station. This was examined weekly for level and specific gravity of its sulphuric acid electrolyte. The plates were occasionally removed from their containers to dispose of any sludge dislodged from the plates which accumulated in the jars during normal service. The lanyard-started Scott petrol engines were run regularly to check that they were performing correctly and started immediately with minimum effort and that the fuel tanks were always full.

The detection and firing circuits were tested electrically daily to ensure that if an intruder crossed any of the loops this fact would become known to the watchkeepers, enabling appropriate counter measures to be taken. For such tests the field was set to 'safe' while the work was carried out as quickly as possible, usually in about 15 minutes.

Using only the low voltage Safety Megger – the detonations being included in the circuits under test – the continuity resistance and insulation leads of the eleven detection and eight firing circuits were measured accurately and logged. During periods of good weather these readings showed very little daily change. However, it was found that a period of prolonged stormy winter weather often caused some damage, frequently serious. The most common fault was a breakdown in the insulation of a circuit which was then regarded as 'earthed'! because both detection and power systems usually operated unearthed, a circuit usually continued to function without trouble when it had only a single earth fault, but when two such faults occurred at different points along its length problems arose. That part of the circuit between the two earths had to be regarded as 'short-circuited'. On a firing circuit, mines connected between two earths probably would not detonate. A detection circuit between two earths would have sensitivity reduced due to the equivalent short-circuitry of turns in the sea loop. In addition, a 'sea cell' would usually develop, as explained later, a condition causing a steady current through the galvanometer which is then continuously deflected off screen.

At CS84, when the routine insulations test first detected an earth fault, its position between the two ends of the circuit could be determined by the common Varley loop test. The method and use of this test were included in the basic training of personnel. It requires continuity tests from both ends of the loop via the fault, enabling the distance to the fault in resistance ohms from the ends of the loop to be determined. Since the healthy continuity resistance of the circuit is known, the position of the fault along the loop conductor can be calculated. Within the limits of experimental error, the estimated position of the fault was usually found to coincide with some definite object or point in the circuit such as a junction box or where the tail passes through the surf between deep water and dry land.

The severity and nature of the damage to which cables are prone are clearly shown in photos. *(Figs 29,30 and 31)*. These particular examples of destruction on tail cables occurred in the surf in the tail landing beach in North Bay which was generally regarded as a sheltered cove. It was found from experience that the damage could be minimised by attaching a pair of sinkers to the straightened cable between the tops of the beach and the deep water beyond the surf. The cable then was taught and nearly immovable at right angles to the breaking waves.

Further complication in maintenance procedures arose when the cable became so deeply embedded in beach sand that its recovery and repair became very difficult, as shown in the photograph *(Fig32)*. Typically, this type of damage was first detected as an earth fault at a routine test, then located by the Varley test and frequently accompanied by a sea cell condition.

*Cable recovery operations*

*Fig 29: Tail cable damaged by beach surf*

*Fig 30: Recovered tail showing surf damage*

*Fig 31: Close-up of surf damaged cable*

*Fig 32: Extricating tail cable from beach sand (Lt Cmdr Holmes, Sub-Lieut De Beer, HEJ Symes)*

2. Sea Cell
A sea cell, here giving rise to small stray voltages and currents in the detection circuit, is caused when two dissimilar metals are immersed in a common conducting liquid or electrolyte. In this case the damaged and exposed copper used as electrical conductors in the cable and the steel of the outer armouring are both in contact with conducting sea water. The voltage developed depends on what two metals are in the electrolyte and is technically termed the electro-motive force or, commonly, the E.M.F. When the copper and steel are electronically connected together by an external conductor a current flows through the circuit so formed. In a detection circuit this fault current also passes through the galvanometer, making it reflect continuously, usually off the end of the screen.

For several reasons, at Saldanha it was always impractical to repair a sea cell fault immediately it occurred. Consequently, temporary remedial steps had to be taken immediately to maintain the loop in a serviceable condition. The normal basic method used was to inject a small direct voltage from torch battery into the affected circuit in the direction, or of a ‘polarity’ opposite to that of the sea cell. By adjusting the value of this voltage so that it exactly balanced that of the sea cell the latter could be completely cancelled out, so that the adverse effect on the galvanometer was eliminated without impeding its normal operation. Unfortunately, the voltage induced by a sea cell is small, uncertain and variable, necessitating frequent adjustment of the injection voltage by means of a regulating resistance.

At CS84 the maintenance staff experimented with a previously untried method of dealing with a sea cell. This consisted of creating an artificial sea cell by placing a short piece of loop cable in a bucket of sea water and connecting its core wires and armoury into the affected detection loop in series opposition to the offending cell. Electrically, the method had the merit of producing the essentially correct balancing voltage, since it was also derived from a pair of the same metals in sea water. It was found to require only minor adjustment from time to time. However, the most attractive feature of the method was that all the materials required were immediately available on a remote station, where ready access to miscellaneous technical equipment was difficult.

Full details of the experiment were reported to the Admiralty; the content of their reply was as follows:

SECRET

From:- The Captain HMS Vernon (C/M)
Adelaide House, Purbrook, Hants

Date:- 5th November, 1943

To:- Commander-in-Chief, South Atlantic.
(Copy to: The C/M Officer, Saldanha Bay.
Director of Torpedoes and Mining, London)

Sea-cell fault on Loop No G3 Saldanha.
Method of balancing out induced E.M.F.

1. The report on the above, accompanying monthly Test Report for July 1943, has been read with considerable interest and credit is due to the personnel for carrying out the operation outlined therein

2. An account of this method will be published in *Vernon Periodical Circular Letter* in due course.

3. The injection of a counter E.M.F. is generally carried out with a small battery, and it would be of interest, should opportunity occur to try both methods.

(Signed) H.G. St J. Bury
For Captain.

3. Galvanometer Polarity Test
A test which was always carried out after commissioning a new loop, or whenever repair work on cabling was necessary, was a signal polarity check on the loop and galvanometer connected together. Correct polarity ensured that a signature from a particular ship was always of the same general pattern when it passed over any loops in the same direction, irrespective of which loop was crossed. For example, if the first swing over a guard loop is to the right, the first swing from the same ship travelling in the same direction over another loop should also be to the right. If a test shows that this is not so the detection polarity is wrong and should be reversed by interchanging a pair of terminal connections on the galvanometer or terminal board. Otherwise, only a ‘minor’ image of the true signature is displayed.

This test was more important than it would at first seem to be. Items of regular advice received from the Admiralty in London included the information that enemy U-boats, when submerged, had been known to enter a defended area by moving in together with a surface ship, either astern of it in the propeller turbulence or close alongside it. Hence it was essential that the identical signature be clearly recognised at each crossing of a loop without the slightest change.

Any discrepancy would immediately arouse suspicion. It is apparent that the reversal of polarity would make discrimination of this degree during a crossing almost impossible.

At Saldanha the most practical and quickest method of checking that all loops and galvanometers were correctly connected was to move an ordinary permanent magnet across a cable arm of the land loop. All the galvanometers would then swing in unison in the same sense.

4. Test with HM Submarine P614

Towards the end of 1943 HM Submarine P614 passed through Cape waters and spent a day at Saldanha. The opportunity was keenly accepted to carry out a series of signature tests over all the loops.

A detailed program of crossings was worked out and arrangements were made for one of the controlled mining SANF officers, Sub-Lieut Dolman to be on board during all the runs. His duty was to discuss every test crossing with the commanding officer, acquainting him with the object of each run and to provide him with a chart of the minefield and tidal data.

The submarine was on the surface for all loop crossings. No submerged tests were attempted. It was considered that underwater runs were not necessary or even desirable, because signatures would be weakest for surface runs where the distance between the vessel and the loop was a maximum. If these were satisfactory then submerged signatures would be even better.

Each loop was tested including those not in the normal traffic lanes where hostile entry might be attempted. These latter called for especially careful navigation, frequently being close to the rocky shore and in shallow water.

Communication between the submarine and CS84 during the test was by radio using plain language.

Test information for the following particular conditions was required:-

(1) A full speed crossing at right angles to the loop. This was to be regarded as a ‘normal’ crossing.
(2) A full speed crossing at a very acute angle to the loop. This yielded a distorted and elongated signature.
(3) A very slow speed crossing at right angles, giving a more prolonged and a weaker signal.
(4) A very slow speed crossing at an acute angle.
(5) A test with the submarine drifting sideways across a loop and carried with the tide, i.e. a condition expected to yield little or no signature.

Needless to say, the field was set to ‘safe’ and the firing generator was locked out during the trial runs.

Some most informative data were obtained from the tests, particularly in providing some typical signatures for the various conditions. These were fully analysed and the results were reported on for submission to the Admiralty, including calculated loop performance graphs. A copy of the letter received in acknowledgement was as follows:-

SECRET

Subject: Saldanha Bay Controlled Minefield – Report on signature tests with submarine.

From: Commander-in-Chief, South Atlantic

Date: 29th November 1943

To: General Officer Commanding Coastal Area
(copy to:- Director, South African Naval Forces)

1. During the recent visit of HM Submarine P614 opportunity was taken to carry out exercises over the Controlled Minefield at Saldanha Bay as a result of which information of considerable technical interest has been acquired.
2. The technical reports which have been compiled are being forwarded to the Admiralty, copy to Director, South African Naval forces, but, should you wish, copies are available at Combined Headquarters for your perusal.
3. I would like to record my appreciation of the assistance that has been afforded to the Royal Navy in the compilation of these data and would especially mention for recommendation the work of Lieutenant Commander J.W.B. Holmes RNR (Seconded to the South African Naval Forces) and Electrical Sub Lieutenant H.E.J Symes, SANF(V)

(Signed) C Tait
VICE ADMIRAL

The results obtained from these tests proved invaluable and were regarded as conclusive in the interpretation of the signatures displayed by the instruments during the events of June 1, 1944 described later.

5. Tests on drums of new cable

In the early life of the minefield some trouble was experienced with newly-laid 18 core detection cable. After a very_short period in service general instances occurred in which this cable developed an open circuit, i.e. complete discontinuity. These faults rendered the loops useless, so that it was imperative that they be repaired immediately. It was subsequently regarded as essential that every drum of 18–core cable should be more thoroughly tested before being used at sea.

At least two drums of new, unused cable were found to be faulty with an open-circuited core when subjected to a combined continuity and capacitative test on each core individually and measured from each end. In every instance it was possible to determine the approximate position of the break. The cable was removed from the drum and cut at this point. A further continuity test indicated which of these two lengths then had the fault. The process was repeated until the fault was finally isolated in about a meter length of cable. From this short piece the serving and armour wires were removed and the eighteen individual rubber-insulator cores separated. The break in the core wire of one piece could be felt with the fingers inside the rubber insulating sheath, the conductor appearing to be very flexible with crepitation noises at the point of failure.

One faulty piece was opened up at the Mining Base in Saldanha and a second untouched sample was sent as retrieved from the cable to HMS Vernon in the UK for their dismantling and examination.

The piece studied in Saldanha revealed a remarkably clean break across all the core wires of the strand at right angles to the core axis so that the fracture appeared to be artificial or deliberate rather than random or indiscriminate.

The report from overseas suggested sabotage during manufacture and supported local conclusions. The subject was taken up strongly with the maker in the UK who was advised to improve the security in his factory and to conduct more thorough tests on the final product.

6. Repairs at Sea

Quite often it became necessary to carry out repairs at sea. When a date for the work had been decided, as a first step the Mining Officer requested of the Commander of the *Spindrift*, Lieut Tanner, that the layer be made available and ready for service. The Mining Base was also asked to place the laying crew on stand-by while the Control Station CS84 was informed of the proposed programme with the request that the field be held at 'safe' during the work in daylight hours.

The Survey Officer, Sub Lieut Sheridan, was requested to have his beacons in place for relaying the tails after repair when the tail recovery method was to be used. Also, he was required to determine beforehand the angular coordinates of the position in the minefield where the repair was to be carried out.

*Fig 33: Mine suspended from Spindrift's derrick*

Finally, as a routine procedure, SANOIC Saldanha, Lieut Cmdr Carroll, was informed that the field would be under repair and inoperative on the day concerned and to warn all ships to keep clear of *Spindrift*. This signal was to be repeated to both the SANF and RN in Cape Town.

Before any work on mine and cable recovery was started, a red explosives flag and the vertical signal hoist for cable handling movement restrictions was displayed at *Spindrift's* mast, consisting, as already seen during the original lay of two black balls with a white diamond between them.

Fig 36: Recovering tail cable from beach

Fig 39: Marker buoy being brought aboard

Fig 38: Tail cable being pulled in over head sheave

One of the two basic procedures was used to start the recovery work involved. The simpler but slower method was to disconnect the end of the tail cable in the terminal chambers on the North Bay head and this was then taken on board the ship, passing over the head sheave, around the capstan on the steam winch on the foredeck and then starting the 'flake' or coil down in the cable hold. The end of the cable was always retained up on deck for electrical testing during the progress of the work. Recovery of the cable proceeded up to the faulty point.

After repair the procedure was reversed and the tail re-laid to the terminal chamber, again using transit markers to avoid the possibility of tails overrunning one another.

The second method of recovery was more commonly used when the fault was in the firing circuit along the string of mines. This involved the use of a creep to recover the cable as near as possible to the calculated position of the fault. Two types of creep, consisting of four heavily-weighted links in tandem, each having one smooth rounded hook at right angles to those of its neighbours, and the four-hooked creep or common grapnel. The grapnel was used where the sea bed was known to be sandy as this moved with deeper penetration of the sand and was more likely to hook the cable. For obvious reasons it could not be used where the bottom was rocky, conditions then being better for the chain creep.

At this stage it will be appreciated how important it was during the lay to record accurately the coordinates of the position of each mine by means of the two sextants. The locality of the cable joining any two mines could be found easily, allowing it to be brought to the surface where it was buoyed during the repair. Also the reason for the extra length of slack cable allowed between mines will be apparent. In practice it was found to be possible to recover the cable between the mines without hooking the surrounding loop cable some 12 metres away.

The reader will have realised that while dragging for the cable the ship must move at right angles to its course during the lay, so that the new course and the two necessary sextant angles must be accurately determined beforehand by the Survey Officer.

Where the repair programme involved cables only, such work could then be done on deck after the exact position of the fault had been located.

*Fig 10: Recovered mine suspended from derrick to allow buoyancy tanks to drain*

Where it was found necessary to haul one or two mines on board these were pulled up by means of the firing cable attached to them until they were hanging vertically just above the surface of the water. While the taut cable was still practically up-and-down and the mine had not yet left the sea bed the position was marked with a buoy to ensure that the mine could be relaid in its correct place between the sides of the indicator loop. The wire hoist rope to the ship's winch and derrick was then securely shackled to the top of the mine, the weight of the latter being transferred from the cable attached to the end of the mine, so that it rotated through 90 degrees and became suspended horizontally. The tanks providing temporary partial buoyancy at the time of laying were then allowed to drain. *(Photo Fig 10)*. At this stage the mine was transferred to the ship's deck by further lifting and slewing the derrick.

*Fig 34: Barnacle encrusted mine lifted to surface*

The first operation was to remove the primer and detonator by unbolting the terminal box cover. The work could be difficult and sometimes dangerous when a mine had been immersed for many months or even years and had become heavily encrusted with marine growth. *(Fig 34)*.

*Fig 40: Removing detonator from recovered mine*

*Fig 43: The main junction box opened on deck for inspection*

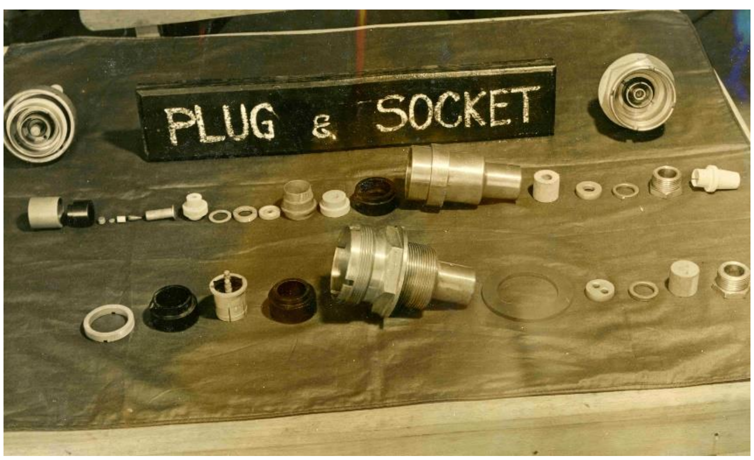



*Fig 41: Parts of underwater plugs and sockets used on mines*

After repair, or more often, replacement the mine was returned to its original locality on the sea bed at the position already buoyed.

In those cases where the repairs could not be completed in daylight hours the brightly coloured marker buoy was left in position overnight, remaining attached to the cable or mine. The new temporary obstruction in the shipping channel was then notified to SANOIC Saldanha.

A problem which arose from the maintenance of the minefield was the method to be used for the disposal of recovered and discarded mines. Instructions simply implied that they should be got rid of as soon as possible and the exact procedure was not stipulated. The writer was keen to destroy them by safe and controlled electric detonation through 1000 metres of firing cable at a place between the sand dunes at the northern end of Danger Bay, about 5km to the west of Saldanha village. The idea was hopefully to have a really unforgettable ‘big bang’ and demonstrate to the army ‘pongos’ and other local service personnel that the Silent Service could also make much noise when occasion demanded. Also, no fish would be destroyed by an underwater explosion.

The Royal Navy vetoed the proposal on the grounds of its being too dangerous. They then issued more specific instructions that unserviceable mines should be exploded at sea in waters of a minimum depth of ten fathoms (18 metres). Further details were not given but were left to the discretion of the mining personnel.

The method evolved and subsequently used on all occasions was to lay the mines from the *Spindrift* in the standard manner, installing normal primers and detonators and running out about 1000 metres of firing tail cable connected to the mines. The ship’s own generator provided the source of power, the current being adjusted to the correct firing value for the actual measured circuit resistance. The site chosen was the area between the guard and mine loops south-east of Malgas but some distance off the shipping lane. The time was slack water at high tide so that dead fish would be carried seaward on the next tidal flow and not be caught up on the rocky islands where this food could not be retrieved *(Fig 44)*.

Firing was through a simple knife switch, the generator and associated equipment being protected by a fuse on the assumption that the tail would be short-circuited by the explosion.

On most of the excursions for mine destruction the writer was at the firing switch in the *Spindrift’s* engine room. This proved to be a most enlightening experience when the effect of the explosion on the ship could be observed. The shock wave was the first to arrive, striking the ship’s outer plating below waterline with a loud ‘clang’. Sounding as though a metal bucket had been hurled hard onto the steel deck. This was followed shortly after by the muffled rumble of the explosion itself.

After the mines had been fired the remainder of the tail cable was hauled in and the ship then waited for about 20 minutes for the fish killed by the explosion to rise to the surface where the ‘catch’ could be collected. Invariably sufficient fish were taken to feed all naval establishments and other organisations in Saldanha for several days.

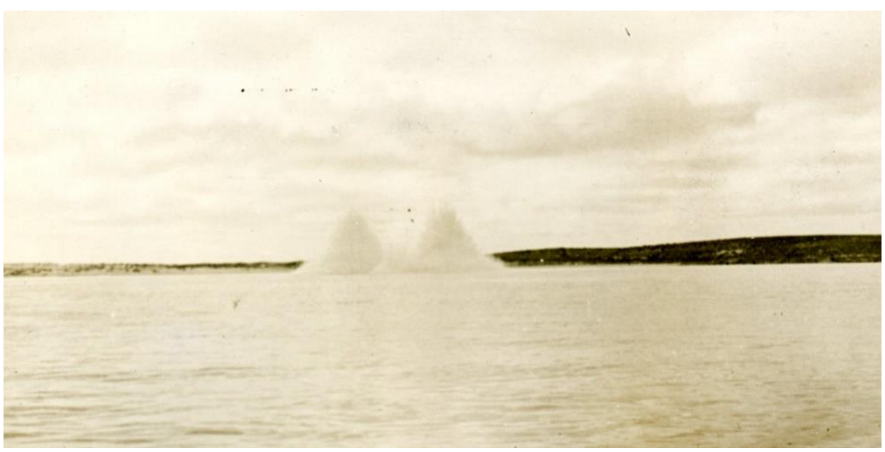


*Fig 44: The destruction of two condemned mines*

It can be recorded here that the only accident and injury sustained by a member of the mining party occurred during repair operations. The *Spindrift* was lying beam-on to a heavy swell while a mine was being lifted inboard. It was swinging from the derrick and got partially out of control, knocking down a crew member and partially crushing him against the ship's structure. Fortunately, his injuries were not serious and confined him to hospital for only a short period.

Very often the recovery and repair work required the *Spindrift* to remain stationary over the minefield for many hours. During this time those members of the crew not actually engaged on the electrical or mechanical works had the opportunity of hanging a fishing line over the ship's rail, with rewarding results.

## 8. ORGANISATION, ADMINISTRATION AND OPERATION

1. Watchkeeping Arrangements at Control Station CS84

The controlled minefield at Saldanha Bay was the only one of its type on the Southern African coast. Consequently, operating procedures had to be developed on site to suit local conditions. A programme was worked out, starting with overseas experience, which was modified from time to time as was found expedient or necessary.

The following is an account of the modus operandi finally adopted at Saldanha and describes some of the problems encountered.

Firstly, it should be emphasised that the normal operation of the minefield demanded continuous concentrated watchkeeping duty by several groups of watchkeepers in rotation for twenty-four hours per day, seven days per week for more than two years.

For this purpose, each watch comprised a Special Branch officer (recognised by the light green bands between the normal naval gold insignia) in charge and three watchkeepers, originally ratings and finally Swans. The usual routine of the seven daily watches for sea-going personnel was adopted. Starting at midnight the watches per twenty-four hours were: Middle (up to 04h00), Morning (04h00 to 08h00), Forenoon (08h00 to noon), Afternoon (noon go 16h00), First Dog (16h00 to 18h00) Last Dog (18h00 to 20h00) and First Watch (20h00 to midnight).

To implement the programme required a minimum of three complete watches on duty in sequence. The Short Dog watches ensured that all watchkeepers had a regular change in their times of duty each day, thus spreading the uninterrupted load more evenly.

CS84 normally maintained a roster of four watches, ie. there was one spare or extra group to allow for leave, sickness etc. When the Swans took over watchkeeping duty from April 1944 one extra rating continued to be attached to each watch. It was his responsibility to start the stand-by firing petrol engine-generator in the event of an alarm, such as an unidentified signature appearing on the screen.

Wall-mounted boards with prominently displayed large name and coloured tags were used for indicating clearly the personnel allocated to each watch. One of these can be seen in photo *Fig 35* which was taken in the control building and shows the officer's desk with Sub-Lieut H Straker on duty. The boards had the advantage that the composition of all the watches and their times of duty could be seen at a glance by everybody. Also, it was easy to make immediate changes should any become necessary, as often occurred at short notice.

Fig 35: CS84 Watchkeeper in control room and Sub-Lieut Straker on duty

Fig 49: CS84 watchkeeping officer (Sub-Lieut Straker) and telephone post lookout

2. The programme of each watch

The two more important positions or duties which demanded the uninterrupted attention of two of the watchkeepers were at the Control Desk and in the Telephone Post. The duty of the watchkeeper at the Control Desk at normal times was to keep the spots of light on the screen under continuous observation and to report any movement of these which may occur, whether they be regular crossings by ships or abnormal perturbations. All his reports were by voice pipe to the Telephone Post. It was also the duty of the Control Desk watchkeeper to take offensive action by firing the mines, should such a step become necessary.

It can very easily be seen that the inaction of sitting in a comfortable chair and watching the eleven spots of light for long periods of time in the complete silence of a partly darkened room, especially during the long night hours, has a very strong soporific or sleep-inducing effect. For this reason the watchkeeper in the Telephone Post challenged the Control Desk over the voice-pipe at frequent intervals and expected an immediate response. For this reason also, the three watchkeepers exchanged their duties regularly in rotation, usually every half hour for the duration of the watch. The rating on the petrol engine was not included in the move around because he normally had very little to do and kept himself occupied on various minor jobs.

During daylight hours the duty of the Telephone Post with its window overlooking the minefield was to keep this area under continual surveillance. At all times he was responsible for the station log entries and noting all incoming and outgoing telephone signals to SANOIC at Magg’s Cottage and other defence establishments in the Saldanha area, such as the guns and searchlights. He recorded accurately the details of the galvanometer swings he received from the Control Desk over the voice-pipe during all ships’ movements across the field. He noted also, all abnormally large perturbations. In collaboration with the officer, he logged the weather, the visibility over the field, fog (common in Saldanha during the winter), wind force on the Beaufort Scale, plus its direction for the period of the watch. The phase of the moon was noted for the night watches when the weather was clear. Any adjustment to the sensitivity of the galvanometer settings was noted in detail, an operation which often became necessary in bad weather. The status of the field, i.e. ‘active’ and ‘safe’ periods, was recorded.

The third watchkeeper had a rest period and usually attended to matters such as coffee making, tidying or cleaning. Private occupations, including letter writing or studying, were normally permitted or even encouraged during uneventful periods.

About sunset each evening, usually at the end of the First Dog watch, SANOIC Saldanha advised CS84 of the code number and radio contact name of the SANF harbour patrol ship for the night. CS84, whose radio name was ‘Lucy’, would then make a routine test call to the patrol vessel to ensure that satisfactory communication could be established if necessary during the night. This was one of the duties of the third watchkeeper at the time. Needless to say, when the Swans took over this daily call it became extremely popular with the radio operators on the night patrol ships.
All activities during the watch were under the constant supervision of the officer who also had a direct telephone to the North Bay barracks ward room.

3. <u>Procedure for ships crossing the field</u>
There were a set of basic rules to control the movement, especially their entry, or all approved ships passing over the minefield. These were:

(a) Ships were permitted to enter or depart only during daylight hours between sunrise and sunset.
(b) Where the several ships of a group eg. a convoy were required to pass over the field at the same time they were instructed to proceed in ‘line ahead’ formation at a minimum distance apart. They were not permitted to cross the field abeam of each other. This was to ensure that a clear, independent signature for each ship separately was registered on the indicator loops and that these signals were readily identifiable.
(c) Each incoming ship was required to identify itself to the satisfaction of the defence authorities before being given permission to cross.
(d) Crossings were permitted only at a steady, reduced, specified speed while travelling in a straight line in a direction allowing them to pass over the loops approximately at right angles, ie. they were required to keep to the normal traffic lanes.
(e) Passage through the minefield was prohibited during periods of fog or at times of heavy rain squalls when visibility was impaired.

On those occasions when ships sought entry at a time when the harbour was closed, they were normally instructed to keep moving at sea until the harbour was re-opened. It was during one such occurrence, before the minefield was laid, that the freighter *City of Hankow* ran ashore and was completely wrecked. She arrived from the north after sunset and, as was customary, was instructed to proceed out to sea and to return at daybreak. It appeared that not enough allowance was made for the prevailing on-shore current, causing her to reach the coast earlier than anticipated before daylight. She unexpectedly ran on to the rocks of the darkened shore line just north of the Saldanha entrance and close to the northern end of Danger Bay *(Fig 1).* (More information on this wreck is given in Section 9 on Personnel).

Generally, the above rules for negotiating the field presented no difficulties in carrying them out. However, a number of incidents did occur in which ships placed themselves in considerable danger. The American mass-produced '*Liberty'* ships were particularly noteworthy in this respect and merit some comment. They were medium sized ships of a simple welded design and were built quickly and cheaply in large numbers mainly to replaces losses on the northern trans-Atlantic routes. Incidentally, they also had the unenviable reputation of being liable to break in half on the high seas.

Operating experience at Saldanha certainly suggested that their captains were also being mass-produced with the minimum disciplinary training. They were notorious for disregarding instructions and proceeding according to their own whims and fancies. Cases occurred where Liberty ships approached the minefield at full speed, cutting across diagonally on the most direct route to the harbour entrance and without proper identification. They were apparently oblivious of both local regulations and the danger of destruction to which they were exposing themselves. Only after repeated frantic challenging, with dire threats, could they be stopped and made to comply with the formalities. On one particular and memorable occasion the ship was very close to the mines before responding to instructions and then suddenly reacted by immediately stopping and proceeding to drop her anchor among the mines! Then, without causing confusion or delay, or publicly disclosing any information about the mines the commander had to be tactfully warned of his impending and dangerous predicament. He was ordered to weigh anchor with the greatest care and to proceed on his course at slow speed without further delay or impeding the progress of following ships.

Details of the standard crossing procedure were drawn up by the local defence authorities. As we have seen, to a large extent these followed suggestion and advice received from the Royal Navy through their regular communications and cooperation. The recommendations were based on their own knowledge of U-boat tactics plus their experience gained from the operation of controlled minefields in other parts of the world, such as around Britain.

Occasionally some snippets of intriguing information were received through this correspondence. For example, one letter contained a record of an attempt made by a submarine to enter a defenced area by a clear deception. A small sailing dinghy with a man at the helm had obtained permission to enter a protected area. However, on being alerted by a signature on a guard loop a closer scrutiny was immediately ordered which revealed that the mast of the craft was actually the periscope of a submarine U-boat below it. What happened thereafter was not reported but following their experience it became necessary to issue instructions to examine very carefully all small vessels requesting entry

*Fig 47: First Swan watchkeepers CS84, 1944*

*Fig 48: The SC84 watchkeeping Swans in working rig*

*Fig 50: Controlled mining administrative and technical staff, Saldanha, 1944*

*Fig 45: SANF staff at Maggs Cottage, Saldanha, 1944*

4. <u>The problem of the co-ordination of defences</u>

The local administration of basic naval functions was from SANOIC (Lt Cmdr Carroll) occupying Magg's Cottage which was situated on the ridge of The Hoedjies Peninsula. However, it was also often necessary to collaborate with the army in a number of matters and this occasionally led to some difficulty. It may be recalled by some that the army always jealously regarded itself as the senior partner of the South African Defence Force for decisions in any inter-service matters, especially so during the earlier part of the war. After 1942 the relationship was still awkward in Navy-Army dialogue. This was partly because the army itself entered the war very much unprepared. It will be recalled that the country at this time had not long emerged from the stultifying effects of the 'bush-cart' approach to modern warfare.

Likewise, naval personnel always considered that the army was not sufficiently 'with it' to have decisions made by 'landlubbers' on subjects which were essentially naval affairs. They resented what seemed to be nothing but wilful military intrusion into wholly maritime matters. Fortunately, the position did improve as the war progressed, with better cohesion between the services.

However, on many occasions the incongruous relationship led to some unusual and often amusing episodes. A number of stories, both true and apocryphal, were in circulation throughout the war. Some of these might well be repeated later as they highlighted the prevailing situation. There was a further division in another direction. The original South African naval ships were fishing trawlers commandeered for service in the ‘Seaward Defence’, the forerunner of the SA Naval Forces. These were fitted out for war work with light guns and equipped for mine sweeping. For full time war service, it was necessary to recruit many extra volunteer civilian personnel and to train them for a much wider variety of highly specialised naval duties. This led to a further faction split or form of rivalry, causing internal friction between the foundation fishing captains, who consequently regarded themselves as the ‘real’ seamen and the ‘hostilities only’ group. The latter were generally not specially experienced in sea-going duties but were usually very much more widely acquainted with a great variety of civilian occupations.

Likewise, full time professional army personnel and war volunteers found themselves in a similar difficult relationship. The former were trained to a greater depth in essentially stereotyped military studies under what may be regarded as cloistered conditions, while the latter were at the outset more proficient, both as individuals and as a group, in a much wider range of practical skills and sciences. Hence most of the specialised duties were allocated to wartime volunteers.

The following are a few varied examples of some of the peculiar situations which were arising in these circumstances.

Early in the war, one of the SANF ships ran aground on the rocks and was damaged. The Defence authorities, ie. basically the army, considered the commander to be guilty of dereliction of duty and that he should be prosecuted. At that time there was no existing naval code under which he could be charged, so he was arraigned under the Military Disciplinary Code. This introduced a further complication – the military code had no provision for wrecking a ship so he was charged under the *Miscellaneous Offences Section 41*, his alleged misdemeanour being stated as ‘hazarding his fortress’.

Another instance: the navy wished to engage a sailmaker for miscellaneous canvas work. The additional appointment to the strength had to be approved by Defence, ie. the Army. The following reply to the application was received:

*‘...we cannot understand your application for a sailmaker on your establishment as we have been under the impression that the South African ships were driven by steam...’.*

And again:

A ship’s propeller shaft had to be removed for a major repair. This required special engineering tackle for its extraction which was requisitioned, as usual, through Defence Stores. The substance of the order was for *‘equipment to draw a propeller shaft.’* Pencils, ruler, compass, rubber, drawing paper and pins were received in due course.

On another occasion an army lookout on the hill behind CS84 reported over the phone that he had sighted a ship moving in the vicinity of the harbour entrance. As it was not visible from the Telephone Post, he was asked on what course it was. He replied that he did not know because *'there was white water at both ends.'*

Some of the problems arising from an attempt to coordinate full-time and 'hostilities only' personnel for smooth working and to avoid square pegs in round holes´ can be seen from the following anecdote.

As far as possible an attempt was always made to place individuals in duties for which they were best suited or already trained. One such new civilian recruit on being interviewed was asked what his work was before he joined up. His answer being: *'I was a foreman platelayer on the railways'* immediately brought the bright reply *'Okay, we'll make you a steward in the officer's ward room.'*

5. <u>Correspondence and Office Organisation</u>
Mentioned here is one of the purely administrative matters which, although insignificant in itself, caused the controlled mining personnel a great deal of trouble for a period of more than two years. It also served to highlight the problems which could be caused by desk-bound bureaucrats in the services being given free rein in their own little kingdoms in their dealings with others.

The first controlled mining group to be permanently stationed in Saldanha was a small working party of basically trained personnel in charge of Sub-Lieut (Special Branch) C G Williams. They established a temporary camp at North Bay in January 1943 on the site of the later permanent barracks. For this purpose, arrangements were made with Army Stores in Cape Town to have camping equipment issued to them, comprising several tents, sleeping bags, mess and cooking equipment.

The camp remained occupied while the barracks were being built. When these were complete and ready for use, the camp equipment was dismantled, packed up and returned to Cape Town by rail. Several months later Army Stores acknowledged receipt of a detailed list of various items but drew attention to the fact that one item, viz. one bag of tent pegs, had not been received and demanded that this be returned to Stores as soon as possible.

The tent pegs had obviously gone astray between Saldanha and Cape Town and a reply to this effect was sent to Army Stores. Some months later a further request was received for the pegs to be sent back without further delay and the same reply as before was sent to Cape Town.

This exchange of 'tent peg' correspondence continued at regular intervals from April 1943 when the camp was dismantled until June 1945 when all the mining equipment was being packed up and despatched from Saldanha. Then the opportunity arose to send the most practical and finalising reply, as described in Section 10, dealing with the destruction of the minefield and the termination of all further activity by the mining group.

The writer became closely associated with all facets of the correspondence through the close-knit administrative web which had been established in Controlled Mining at Saldanha at this period. In outline, the working arrangement was as follows:

During the final year that the field was in service the writer was, at that time, officer-in-charge of the Control Station CS84; he was also the mining officer at the Klipvlei mining base; he was technical officer to Controlled Mining in Saldanha and for several periods was acting senior officer, Controlled Mining.

Each of these divisions or functions was required to keep its own records and file of correspondence at its particular office. As can be imagined, some peculiar and often amusing situations would frequently arise. For example. The following would be a typical sequence of correspondence in a case where regular tests might reveal a serious fault at sea in the minefield which required major repair:

The technical officer responsible for monitoring the condition of the field - ie. the writer - would first determine the nature of the trouble and would submit a written report to the OIC, CS84 – also the writer. This officer would, in turn, report the fault to the Controlled Mining Officer, Saldanha – ie the writer – sending with his letter a copy of the technical officer's report. The Mining Officer, Saldanha – the writer – would advise Admiralty, Cape Town and the SA Naval Officer-in-charge, Saldanha (Lt Cmdr Carroll). He also instructed the Mining Officer at the Klipvlei Base – the writer – to prepare the necessary material required for the repair. The Mining Officer, Klipvlei, would then inform the Controlled Mining Officer, Saldanha when he would be ready for work at sea and request that *Spindrift* be prepared to put to sea on that date. On receipt of this letter the Controlled Mining Officer, Saldanha – the writer – would send a letter of instruction to the Commander of the Spindrift (Lt Tanner) to prepare his ship for this week, detailing the exact requirements and also the proposed timetable.

The great attribute of this particular administrative system was the there was no delay in sending and replying to a complicated sequence of correspondence, so that work could be handled expeditiously. In fact, all the exchange of letters could be handled by one person at a single sitting, even though the volume of typing was often substantial. Every department concerned knew simultaneously exactly what was happening, what its responsibility was and what its action should be.

Needless to say, the officer concerned and the Swan typist (mostly June Calder) worked out some ingenious, and in many ways comical, systems of streamlining the work load such as the typing and filing of letters. Great care was necessary to ensure that the correct letters and their copies went into the correct files!

The system also allowed changes in the work programme to be made easily and at short notice with the minimum upset or dislocation of programme.

The above illustration should give the reader some general idea of how clerical work was eventually organised. The final stage of the exasperating subject of the tent pegs was one of the items which went through this system to a rapid and successful conclusion.

6. <u>Payment of personnel on the isolated station</u>

In the early stages of the occupation of the North Bay site by the Controlled Mining group, ie. during the 'tent' period, one of the administrative matters which should have been relatively simple actually turned out to be difficult to make it work satisfactorily. This was a procedure to ensure that personnel received their service pay promptly. Even though there was virtually nothing within range of the camp on which any money could be spent some members of the party had domestic responsibilities which demanded regular attention.

At the start the naval accounts office had the bright idea of sending the money by crossed cheques! – by means of the SANF patrol ships running regularly from Cape Town to Saldanha. There were, of course, frequent delays and misdirection of payments which were mostly due to the fact that nobody in the group had a bank account of any form in the Saldanha area. The obstruction, confusion, frustration and misunderstanding which arose in trying to clear the chaos and in endeavouring to change the arrangements to everyone's satisfaction can be imagined.

The final solution adopted, except where individuals requested otherwise, was for the SANF paymaster to include isolated North Bay on his routine rounds – an arrangement which was maintained satisfactorily up to the conclusion of all Controlled Mining activities in mid-1945.

## 9. PERSONNEL

A. <u>The Team and Its Selection</u>
As already noted, at the outbreak of World War ll the only South African Naval group was the 'Seaward Defence'. It was essentially a reserve type of organisation where sea-going vessels comprised a number of trawlers and whalers belonging to private enterprises. These could be armed and taken into wartime naval service at relatively short notice. They were in some ways the pelagic counterpart of the army's reticulated bush carts with which South Africa rather naively declared war on Sept 5, 1939. The situation at sea at the time was also in many respects reminiscent of the sixteenth century decree promulgated by Elizabeth I of England, requiring that fish be eaten on Fridays. By this means she ensured that the fishing fleet was always maintained as an operating entity and remained large enough to provide an adequate pool of experienced seamen who, in time of national emergency, could be pressed into service in her navy without further training.

While these 'little ships' of the South African navy served with distinction during the war, most of the personnel taken over into the full-time fighting service were by and large not specifically trained or conversant with the latest and sophisticated technology relating to anti-submarine warfare, particularly in the use of the more recent shore-based equipment. Also, there were too few officers and men available for the many essential and diverse duties associated with both defensive and offensive underwater weaponry against submarines.

It was thus necessary to embark upon an immediate programme of large scale recruitment and training for these specialised services which included 'degaussing' (ie. demagnetising) of ships for their protection against magnetic mines, ASDIC technology, sea bed detection loops and controlled mining.

At an early stage of hostilities, the name of the service was changed to South African Naval Forces (SANF). Recruitment of civilians progressed rapidly and well.

Compared with peacetime enrolment into the martial arts, a great advantage of wartime voluntary recruitment was that it attracted many mature people who were not only eager to 'do their bit' but were usually expert or already trained and experienced in a great variety of civilian skills and disciplines. They were mostly well educated and adjusted, a high proportion having university degrees and had already learned to think for themselves; they were easily motivated and soon displayed initiative and responsibility; they readily assimilated or adapted themselves to their new knowledge, training, duties and environment. In addition, compared with forms of compulsory services, they were blissfully free of any stultifying 'trade union' attitude to their responsibilities, such as bedevilled some of the other Allied fighting forces. For example, in controlled mining, among the few newly recruited officers were to be found factory and business managers, a school teacher, a surveyor, an accountant, an engineer, a zoologist, a journalist and a ballistics expert, all working together to master their new common task. Among the rank and file there were several matriculants, industrious and intelligent students whose studies were interrupted by the war and experienced artisans. The head of the SANF Technical Special Branch Services, Cmdr B L Goodlets, himself a distinguished research scientist and engineer, was professor of electrical engineering at the University of Cape Town. He was ably assisted by Lieut-Cmdr James, a research scientist with the Chamber of Mines and Lieut Middlecote who later became departmental head of the SA Bureau of Standards. The first wireman attached to controlled mining eventually became professor of Electrical Engineering at Cape Town.

Training of the new special personnel was thus easy and was completed expeditiously, many of the trainees themselves soon becoming instructors for later recruits. The controlled mining unit was consequently very soon operational as a separate entity with the whole group enjoying a high level of morale, good standards and displaying much personal interest in their work through the remaining war years.

*Fig 52: The original personnel at CS84*

*The working crew*

Recruitment of senior specialised officers was also by invitation, a procedure which proved to be most rewarding both immediately and during their subsequent war service. It also avoided some of the pitfalls in the relationship between the specialist group and the hard-core, dyed-in-the-wool seamen referred to earlier.

The gathering of personnel for the controlled mining project brought together some extremely interesting and unusual personalities. Probably the most colourful and remarkable was Lieut James Marr, RNVR, a pleasant, quiet, middle-aged officer at the time of this narrative. He was the first administrative officer at CS84, being responsible for liaison with building contractors, receipt of stores and equipment and personnel matters. He had the Master of Arts and Bachelor of Science degrees of the Aberdeen University and held the medal of the Royal Humane Society for life-saving. Later he was also awarded the Polar Medal, with three clasps, for service in the Antarctic and Arctic regions with several of the well-known expeditions.

Some readers may know that the famous Antarctic explorer, Sir Ernest Shackleton, in Sept 1921 took with him on his third and last expedition aboard the *'Quest'* a keen young boy scout from Aberdeen, to give him the experience of a lifetime. The scout's name was James Marr, none other than our Lieut Marr. As events turned out, Marr was present at Shackleton's death on board the *Quest* three months later on Jan 5, 1922, when the ship was off South Georgia. Marr's selection for this expedition became the subject of correspondence between Sir Ernest and the Chief Scout, Sir Robert Baden-Powell, as well as a published statement on the subject by HRH The Prince of Wales as Patron of the Scout movement.

Professor Marr became a zoologist, specialising in Antarctic bird and sea life and was consequently accustomed to solitary living in remote places. He was also one of the first officers at North Bay in the early pioneering tent days, the circumstances providing an environment in which he was naturally in his element. He led many interesting discussions with the South African officers on Antarctic scientific research on wildlife. These talks took place during and after our evening meal following a hard day's outdoor activity over the period that early work on the field was being carried out. He could chat for hours on whales and seals, penguins, gulls and albatross. He was greatly interested in the bird life, mostly gannets, on the guano islands at Saldanha. He took personal interest in a penguin which used to come ashore to visit the camp site regularly and scratch through the garbage tip. It almost became a permanent pet.

Unfortunately, Marr had a speech impediment which caused him to stutter for long periods at a time. The SA Naval Officer in charge at Magg's Cottage during that period also stammered badly. On one unforgettable morning this officer came to the camp to discuss a contentious administrative matter which mainly concerned Marr. A very heated argument broke out between them. The incident developed into one of the most extraordinary displays for an onlooker one can imagine, with both of them spluttering and stuttering together for several minutes and exchanging little or no actual information.

*Fig 51: Wireman Alleman, Wireman Buchan and McLaren*

Early in 1943 Marr left for service elsewhere with the RN when the Saldanha field had been completed and handed over to South African administration.

Another unusual personality at CS84 was wireman Buchan *(Figs: 51 and 69)*. He was a skilled artisan who could make almost anything from scrap material and working with limited facilities. It was necessary only to mention one's need to have a certain article for the completed artefact, beautifully made and painted to appear a week or two later. Many examples of his work were to be seen at CS84, involving the watchkeeping roster boards on the wall shown in photo no. 35.

A contemporary of his, L/S Daniell, was equally enterprising but in a quite different way. Daniell possessed the remarkable capacity of being able to procure the unobtainable. When an apparently insurmountable problem of acquiring a difficult item arose one would call in Daniell and put the request to him. With a twinkle in his eye he would say *'I will see what I can do, Sir'*. Sometime later he would appear with the article and say *'Is this what you want, Sir?'* In many cases it was obvious that no further questions should be asked or answers expected.

*Some of the mine laying team*

It was perhaps inevitable that a group of people such as the controlled mining team at Saldanha should include some individuals who, if not actually 'accident prone', nevertheless seemed to find themselves at the centre of any abnormal occurrence. This certainly applied to Swan Sue Labuschagne. She was directly involved in the extraordinary events of June 1, 1944, and also encountered the porcupine in the toilet, or 'heads' at CS84. These two incidents gave her the special names she acquired at Saldanha, viz. *'Porcupine Sue'* and the *'Angry Female'*.

The South African officers who, at various times over the two years of the field's working life, were responsible for controlled mining in Saldanha, following the departure of the RN personnel included:

| | |
|---|---|
| Lieut Tanner | On the minelayer *Spindrift* |
| Sub-Lieut Riddle | On the minelayer *Spindrift* |
| Lieut Dolman | In charge of administration at North Bay Naval Barracks |
| Sub-Lieut Sheridan | Survey Officer and Cartographer |
| Sub-Lieut Williams | Watchkeeping Officer at CS84 |
| Sub-Lieut Bateman | Watchkeeping Officer at CS84 |
| Sub-Lieut Straker | Watchkeeping Officer at CS84 |
| Sub-Lieut de Beer | Watchkeeping Officer at CS84 |
| Sub-Lieut Gibson | Watchkeeping Officer at CS84 |
| Sub-Lieut Burgh | General Assistant |
| Elec Lieut Symes | Mining, Engineering and Technical Officer |

Fig 58: Controlled mining officers
Back: Sheridan, Straker
Front: Symes, Bateman, Holmes, Williams, De Beer

*Some of the officers from CS84*

B. Disciplinary Training

All new civilian recruits were required first to undergo a course of disciplinary training in Cape Town which was generally of about two months duration. It embodied instruction for all ranks, both officers and ratings. The course was given at the shore base HMSAS Unitie which was, before the war, a yacht club basin and buildings, the complex being taken over by the Defence Authorities. It was situated at the eastern end of the newly completed Duncan Dock, close to the Woodstock district of Cape Town. The ratings were accommodated on the base while the officers were billeted ashore, mostly in hotels or in private homes.

In the second half of 1942, at the time of this account, the establishment was under the very able supervision and control of Cmdr W J Copenhagen ('Copey'), ably assisted by his popular No.1, Lieut Smith, or 'Smitty' as he was known to all.
The instruction was intended to acquaint 'rookies with the fundamentals of living and working in the navy. 'Divisions' and morning prayers were held daily, the assembly frequently singing *'…for those in peril on the sea'*.

The Special Branch officers included all those intended for the shore-based, anti-submarine technical units and not only for controlled mining. The watchkeeping officers could be recognised by the bright green bands between their gold sleeve insignia or shoulder straps while the electrical officers, recruited by Cmdr Goodlet, wore dark green. For their parade ground drill they were required to don boots and anklets and march up and down the square on the south side of the main buildings, overlooked by majestic Table Mountain. They were taught how to salute, whom to salute, the difference between naval and army saluting, recognition of the equivalent ranks of the army, navy and air forces of the Allied services etc.

The more practical part of the officers' training covered such subjects as naval gunnery, all forms of signalling, including Morse code, semaphore flags, Aldi's lamps, flag hoist groups and the use of naval code books for manoeuvres at sea.

The actual instruction was given by loud-voiced chief petty officers from the Royal Navy. This in itself was a memorable experience, particularly under such personalities as CPO Barrett, CPO Jackson and others who seemed to the recruits, to take special delight in imposing their temporary authority over the rookie landlubber officers. Nevertheless, despite the rigours of discipline, there was frequently some humour in the course, not always intentional. For example, during a detailed discussion on the Bofors gun, while such a weapon was lying dismantled on the lecture table, the CPO instructor picked up one component and pointing to an opening through it, said in all seriousness *'…and this 'ere 'ole is called 'the aperture'*, a statement which immediately' brought the house down'.

On another occasion the officers' class was receiving instruction and was being given practice on how to deal with a misfired shell in a naval gun. The normal procedure is to open the breach block, remove the shell and dump it overboard into the sea, the whole sequence being completed as quickly as possible. The instructional gun at Unitie was mounted at the edge of the Duncan Dock and, for the purpose of the exercise, was loaded with the gun's only dummy shell. Three members of the class were allocated misfire duties and ordered to carry out the routine drill. The recruits, entering into the spirit of the occasion, were rather too realistic, with the disposal officer running to the edge of the dock with the heavy shell in his arms, dumping it into the water, where it promptly sank, slipping and very nearly following it himself. The CPO instructor was furious, spluttering and raving for nearly a minute, while the class unsuccessfully tried to stifle their titters. That was the end of instruction on misfires.

Cmdr Copenhagen was always in favour of a fairly high degree of literacy and proficiency in the three R's in the trained ratings that left Unitie and himself helped to select suitable candidates for particular duties. This involved final written examinations, so that he wisely requested officers of the Special Branch class who had university degrees to assist him in marking test papers while they were at Unitie. The writer and other fellow officers on several occasions spent all night checking exam papers to enable personnel to be drafted out to their new service duties the next day.

C. Controlled Mining Training

The special instruction required for the original group of South African Controlled Mining personnel, both officers and men, was given basically in two stages.

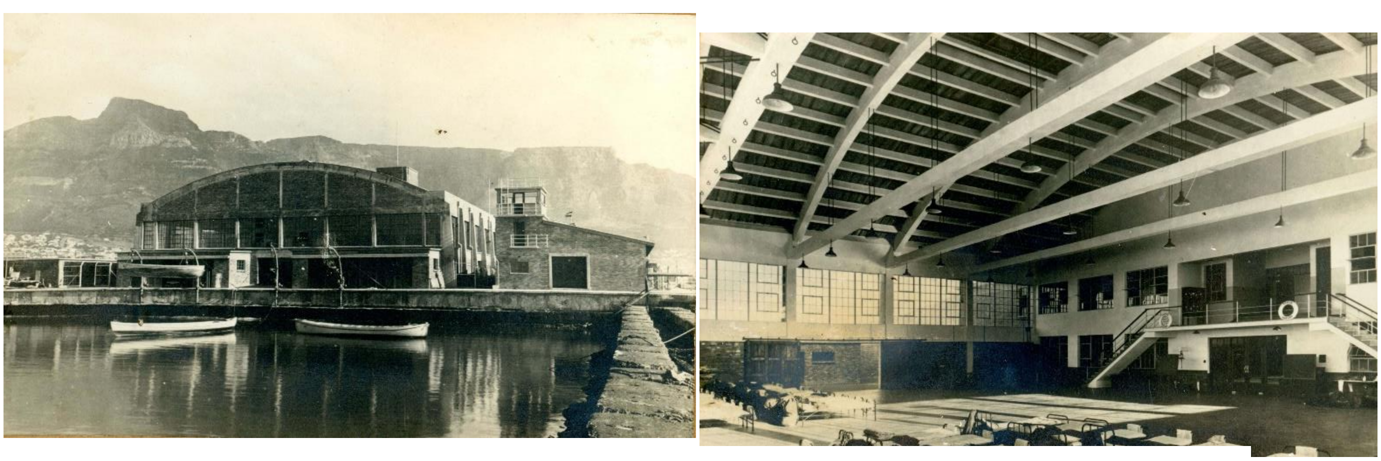


*Fig 60: HMSAS Unitie,, the SANF training base in Cape Town*

Firstly, there was a course of lectures or classroom instruction at Unitie given by the RN officers already in controlled mining and seconded to the SANF. These included Lieut-Cmdr JE Holmes and Lieut Chapman with the practical assistance of CPO Raws. The writer assisted these officers in the capacity of electrical engineer attached to the group. One lecture room and part of the yard at Unitie, together with an office, were temporarily allocated to controlled mining, up to the time when all the group's activities was transferred to Saldanha, ie. the accommodation was occupied from January to March 1943. *Fig 53* shows instruction being given at Unitie on generator engines.


*Fig 53: Controlled mining wireman's class at Unitie 1943*

Secondly, the South African members of the laying group, ie. the writer and ratings, then spent some two months on board the mining depot ship *Manchester City*, laying at anchor in Hoedjies Bay at Saldanha, from January to March 1943. During this period the minefield was designed, prepared and laid, allowing the trainees to become fully conversant with the practical sea-going aspects of their future duties on board the layer, *Spindrift.*

As a final confirmatory test of their proficiency, the South African party on their own prepared, rigged and laid the last of the eleven loops. The RN crew, who were present as back-up observers only, as a check test deliberately introduced two errors in the loop cable rigging. Fortunately, these were seen on the final routine examination of all items and connected before the lay. As this operation completed the field a lively party was held on board the *Manchester City* at which the writer was presented with a pair of mine-laying blue and yellow hand signal flags as the first SANF controlled mine laying officer.

The instruction of later personnel, including the first group of Swans, was carried out in the special classrooms in the newly completed mining base in Saldanha. *(Fig 22)*

The content of the instructional curriculum naturally fell into two sections, viz. watchkeeping, including administrative work at the control station, and sea-going mine laying, together with subsequent maintenance, renovation, preparation and storage of materials such as mines and cables. All trainees were first given a general talk to explain the broad principles and fundamentals of controlled mining and how a field was planned, laid, operated and maintained. They were taught simple electro-magnetism as applied to anti-submarine warfare and the detection of underwater craft.

New crew members who joined after laying the field in early 1943 were trained by working alongside the 'old hands'.

However, to assist the sea-going trainees to understand how the layer was rigged with a loop of mines where there were no immediate plans for laying mines, a small model was constructed for table-top demonstration, having all the essential mine-laying features of the *Spindrift,* using small wood mines, cords for electric cables with miniature coloured turks heads and dummy junction boxes. The model is shown in *Fig 16*. It was also used to examine the ability of each member of the crew to rig the ship with cables and mines.

Members of the laying crew were instructed in the duties of every position or job on board the ship during a lay, so that they were, in effect, inter-changeable to allow for emergencies, sickness and leave.

Practice in cable jointing, fitting of junction boxes, making of puddings and turks heads and carrying out electrical tests for insulation and continuity by using a megger was given on the work bench. Any members of the group, apart from wiremen, who were interested in being able to carry out a Varley loop test were shown how to do so, on a mine firing circuit, for example, using a megger and a Varley loop test box which was specially built by the controlled mining personnel in Saldanha. It is shown in *Fig 54*. In using this equipment a deliberate earth fault is applied to the dummy loops at any arbitrary point. The lid is then closed down and the candidate is asked to test for a fault and to calculate where, ie. on which mine of the group, the fault is located. A higher level of general proficiency in their work was expected from wiremen, so that they were given more detailed training. They were generally responsible for the daily and weekly tests. It is worthy of note that several Swans qualified as wiremen after taking their advanced course.


*Fig 54: Varley tester for instruction in finding the position of earth faults on cables*

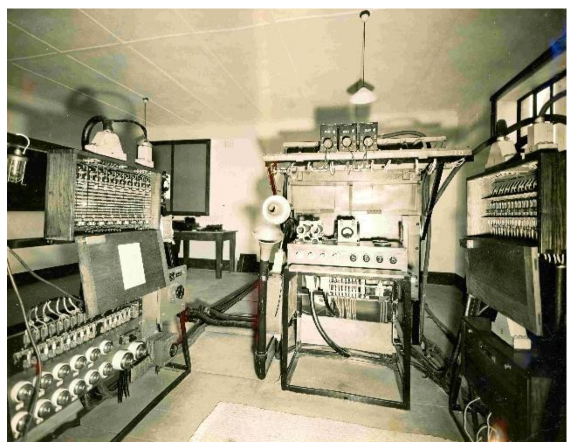


*Fig 62: Watchkeeper's instructional unit at Klipvlei*

The watchkeepers were instructed to report all galvanometer signals and excessive perturbations over the voice pipe between the control deck and the telephone post. They had to demonstrate that they knew the correct instant at which to fire the mines. They also learned to keep the watch log book.

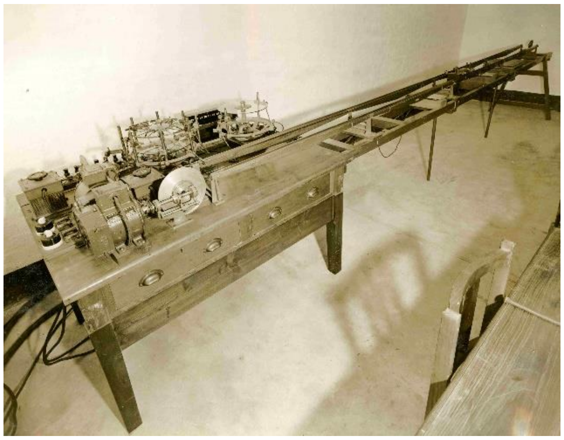


*Fig 55: Attack teacher*

Actual firing instruction and relating the drill to the incoming galvanometer signal was given on the specially designed and built attack teacher. It is shown in *Fig 55*.

It consists of a dummy vessel or 'intruder' in the form of a wood block fitted with wheels and running along rails at an infinitely variable but slow speed. It is driven by an electric motor and endless band. The block has a number of horizontal and vertical holes drilled in it, through which bar magnets can be inserted to simulate any magnetic characteristic in the intruder. Small, moveable guard and mine loops can be placed under the rails to detect the magnetic vessel passing over. The outgoing connections from the loops are coupled to the galvanometers and screen of an attack simulator (an exact replica of the actual control desk) in an adjoining room where the wood 'ship' cannot be seen by the watchkeeper undergoing the test.

An added refinement is a perturbation generator which is an irregular rotating disc or cam causing several magnets to move near coils connected in series with the loops. Perturbations similar to those due to wave action can be injected into the galvanometer circuits, as well as synchronised disturbances affecting all the loops together as happens with terrestrial magnetic swings. The superimposition of the perturbations tests the skill of the watchkeeper in discriminating between genuine signals and 'noise'.

Basic instruction also included some training in the use, storage and handling of explosives, particularly amatol and also the characteristics of primers and detonators.

At the conclusion of his disciplinary training in January 1943 the writer was sent to Robben Island for a short period to become familiar with ASDIC operated from Robben Island and to learn the broad principles of de-gauzing ships on the loop and range established for this purpose.

However, it was necessary to curtail this instruction and return to Unitie because of the unexpected illness of one of the RN controlled mining instruction officers, the writer being required to take over the electrical lectures to mining personnel. Also the arrival at Saldanha of the *Manchester City* and *Spindrift* was imminent and it was necessary to make arrangements for the initial party of South African personnel to be billeted aboard the *Manchester City* for an estimated period of three months while all the materials for the field were being prepared and laid. The writer returned from Robben Island to Cape Town on board the famous *Izie* – the only occasion during his three years with the SANF when he felt seasick!

D. <u>Welfare and Recreation</u>

Apart from the general requirements for the welfare of personnel, the old adage about the devil finding mischief for idle hands certainly could be expected to have its full meaning in a place like Saldanha in the early 1940s. Here a number of people had been brought together in an isolated locality by the abnormal circumstances of war. At North Bay there was not even electric power in the early stages of the tent encampment, so that all activity was necessarily restricted to daylight hours.

From the outset it was realised that keeping everybody reasonably occupied, both at work and leisure would become increasingly important, even after the North Bay base was fully established and running. The situation demanded a fine balance between firm discipline and the sympathetic consideration of individuals. Once the minefield had been laid, apart from the continuous watchkeeping, there was very little work to do as long as all equipment remained healthy and functional. This meant that summer, with its good weather and long days, was the time when boredom and idleness could be expected to cause the most concern. During the winter there were often heavy weather and storms from the north-west which caused a variety of faults in the field and meant that seagoing personnel were more steadily occupied.

As far as possible the hands, other than watchkeepers, were given work on the routine preparation of mining materials for future emergencies, the restoration of recovered equipment, cleaning, repairing and painting etc. Individual hobbies were always actively supported, including occupations such as gardening and groundwork around the barracks and CS84.

Those whose university or similar courses had been interrupted were encouraged to study and to discuss subjects associated with their future work and careers. The generally broad intellectual interests of most individuals were helpful in this respect.

Reading, letter writing and drafting of reports were conveniently done during the long, uneventful night watches when electric power had been installed.

There were very few instances of trouble between ratings or insubordination towards authority. Some straight talking usually cleared the air but, where this approach seemed to be insufficient, the infallible panacea of threatening a posting away from Saldanha to Walvis Bay made the recalcitrant toe the line.

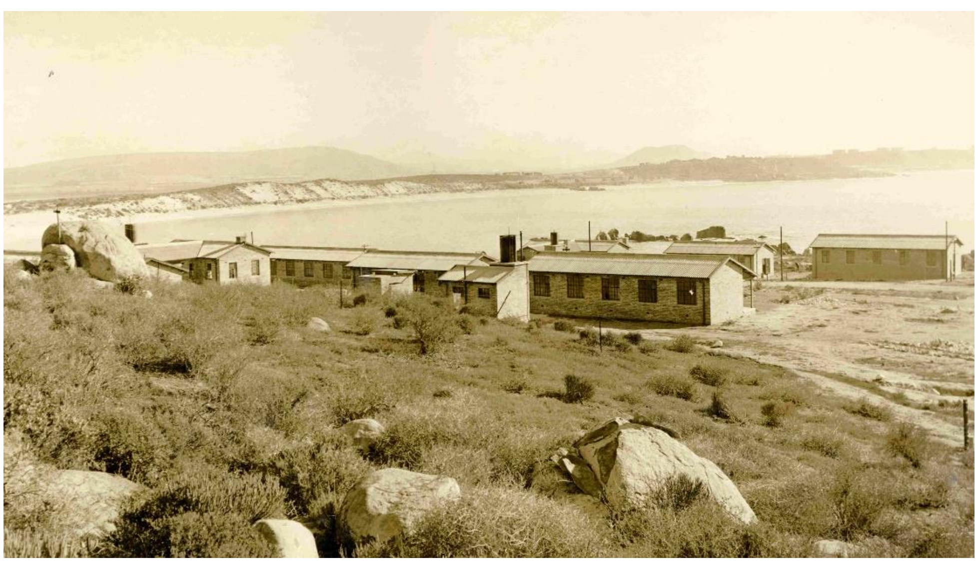


*Fig 63: North Bay naval barracks*

‘Make-and-Mends’ were, of course, part of the regular routine and virtually gave personnel the opportunity to do whatever they wished. Leave from Saldanha was granted to everybody one weekend in four, from Friday afternoon to Monday morning, most commonly taken for a visit to Cape Town. Where it was not possible to find a private or service lift by road, the South African Railways operated a special weekly sleeper passenger train for all service personnel in Saldanha. It departed at 21.00 on Friday evening and returned by 6.00 Monday morning.

However, free time in Saldanha was spent in many different and often interesting ways. As the weather was usually good, long exploratory walks were most popular. During the summer it was necessary to take great care and always carry a stick as Cape cobras abounded, especially in the area between North Bay and Danger Bay. Fortunately, the larger and older snakes could be easily seen and recognised on the light, sandy ground by their dark, copper-brown colour. The younger ones were yellow or orange and not seen as often.

While out on such walks Sub-Lieut Bateman and the writer discovered a number of stone-age artefacts in the low-lying Klipvlei area between Saldanha Village and North Bay. These were later identified by archaeologists as of Wilton culture and the area was classified as an extension of the already known Hopefield site. At the end of the two-year period in Saldanha some six hundred specimens, mostly small crescents, scrapers and flakes found on the site, were handed over to the University of Cape Town.

It was necessary to obtain special permission to go on to the guano islands, but a visit was well worthwhile to see the thousands of gannets. A landing that was made on Jutten Island on one occasion was particularly rewarding; a number of silver thaler coins were found wedged between the rocks. These were reputed to have come from the wreck of an old Dutch East Indiaman, the *Merestyn* which sank in 1702.

While on this subject, an interesting discovery on the top of the Hoedjies peninsula at about this time was that of a skeleton in an unmarked grave. The skull was physically damaged and from early ship’s records the remains were identified as those of a ship’s officer in the Dutch East India Company who went ashore and fought a duel with a fellow officer and was killed.

Whenever it seemed that occupational activity was grinding to a halt an event like a paper chase was organised. This required very little preparatory work and kept all participants exercised and busy for a few hours.

One interesting diversion was horse riding. The army kept a number of horses in Saldanha for their staff officers to move about over the local sandy, trackless or difficult terrain. It transpired that the animals were not being used sufficiently to exercise them so the request was circulated around the army and navy establishments in Saldanha that service personnel take them out for a ride whenever they felt so inclined. One very keen rider was the high-ranking RN representative officer who was permanently billeted at the Saldanha Hotel. On one occasion the writer was out on a walk over the sand dunes at the north end of Danger Bay. Suddenly a ‘tea leaf’ bedecked naval cap approached at high speed, bobbing up and down just visible above the scrub growth topping the dunes. A few moments later the rider and his horse came into view. It was our RN officer out for his afternoon ride. He stopped and dismounted to have a chat and rest his horse before continuing.

Chess, study, reading and letter writing were common occupations during the long uneventful night watches. This was also the most popular time for preparing and drafting reports and doing some theoretical analytical work on the minefield.

Sub-Lieut de Beer and the writer were of the opinion that a safe swimming pool in North Bay was a desirable adjunct to the barracks' amenities. The only suitable site, ie. one with the sea breaking in, almost entirely enclosed by rocks and having a gently shelving, sandy bottom from a beach was, unfortunately, completely choked with a heavy growth of seaweed. The decision was then made to clear this weed over a period of time by each bather who used the pool making a number of dives, hauling himself down to the roots where the long fronds were cut free with a knife. After several months work an excellent and much used pool was completed. *(Fig: 56)*

*Fig 56: Swimming pool and boat launching beach, North Bay*

Fishing was not indulged into the extent which might be expected. However, there were some good crayfish to be taken from the vicinity of the rocks in North Bay and these provided a welcome addition to the somewhat unimaginative rations.

An unfortunate mishap, but one which provided many opportunities for recreational entertainment was the wreck of the freighter *City of Hankow.* This event took place during the summer of 1942/3, the ship running on to the rocks close to the southern end of Danger Bay in the north shore of the main entrance to Saldanha Bay and about 4km from CS84.

For many months the vessel remained firmly wedged in an upright position, facing inshore and, from a distance, looking exactly as if it were tied up in a harbour. It was quite impossible to board the ship without special facilities because it was about 100 metres from dry land in an extremely rocky area and always surrounded by heavy surf and breaking seas.

It became a centre of attraction and the destination of walks for many of the off-duty controlled mining personnel. The first period of heavy winter weather broke off the stern portion so that the remainder of the ship presented an open end towards the sea. Incoming waves were thus guided and trapped in the hull and gave rise to a spectacular display with partly compressed air and water then being ejected to a great height out of the funnel and deck ventilators.

At this stage the vessel started to break up rapidly. It carried a deck cargo of military field guns and tanks while the holds were filled with miscellaneous merchandise. Belatedly, the army took steps to remove the deck cargo, an operation which was successfully completed during a spell of fine weather. The hull was disintegrating, allowing a variety of goods to be scattered into the sea and eventually washed ashore among the rocks. The wreck then became the centre of increasing interest with the surrounding rocks and nearby sand dunes and scrub being covered or festooned with tangled skeins of brightly coloured knitting wool. The whole area was littered with electric light globes and thousands of lead pencils – all inscribed *City of Johannesburg* – bolts of cloth and many other articles.

At this stage the Dept of Customs and Excise took an interest and placed a 24-hour guard on the wreck and its environs. This step was too late as the bulk of the material washed ashore had already been taken away.

A number of the light globes appeared at the North Bay barracks. It was found that some of them had become partly filled with water and, if used, they worked satisfactorily for a few minutes then noisily blew up. For weeks afterwards one was likely to become the victim of a prank when, on switching on the cabin or wardroom light there would be an explosion, scattering water and fine glass, followed by an inconvenient blackout.

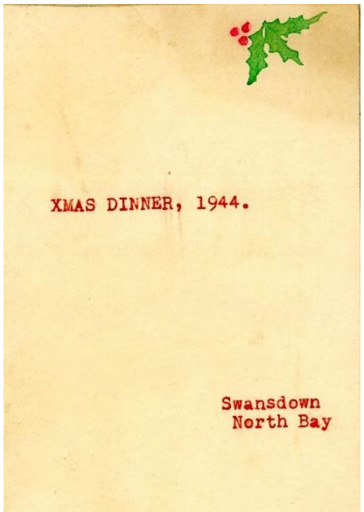
One evening the officers in the wardroom decided to play a trick on one of their number with whom they were annoyed. In the wardroom there were two telephones, one on each side of the room. One instrument was connected to the Saldanha exchange, giving access to Cape Town, while the other was on a party line to CS84 and Magg's Cottage which could switch to a direct line to SANF headquarters in Cape Town. It was thus possible to put a call across the wardroom via Cape Town. This was done, the victim being called to one phone for a 'special important call from Cape Town!' The conversation had been going for about ten minutes before he realised what was happening from the tittering, red faces and suppressed laughter around him and that he was merely speaking to the officer seated with his back to him at the other phone.

Occasionally ordinary sports afternoons were held. One such meeting in which the Swans took part is shown in *Figs 64 and 65*.

*Fig: 65 Swans' sports day*

*Relaxing*

Evening parties were quite frequent, either at North Bay or at the army base on top of the hill, especially in the last year or so of the war. Christmas and New Year were special occasions. For interest, using the rations available, the menu for Christmas dinner in 1944 at North Bay was:




**MENU**
Vegetable Soup
Fish
Poultry and Vegetables
Xmas Pudding
Fruit Jelly
Coffee

From time to time evening entertainment consisted of a concert in the Saldanha services hall by well-known local or visiting overseas performers. On one occasion towards the end of the war, Noel Coward visited Saldanha and, during the day, was a guest of the officer's wardroom at North Bay. It is interesting to record that his presence coincided with one of the rare visits to the Controlled Mining group by Cmdr Goodlet. It was thus a most unusual assembly around the meal table, the conversation covering some extremely interesting and diverse topics.

During the evening variety concert in Saldanha village, which was well attended by the local public and army and navy personnel, Goodlet and the writer sitting at the back of the hall in subdued light, took the opportunity to have a serious private whispered discussion on our work. The conversation drifted towards various scientific and technical matters relating to the future Allied conduct of the war. While the audience was engrossed in Noel Coward's performance and was rapt in his words about *'Mad dogs and Englishmen going out in the noonday sun'* Goodlet leaned over and, with his characteristic, well-known smile and his eyes half closed, said in a low, carefully directed voice, *'We now have something which will finish the war in a day!'*

This was the first hint of the existence of the atomic bomb. The time was shortly before the terrific events at Hiroshima and Nagasaki shattered not only these two Japanese cities but also upset the conscience of the whole world and heralded the introduction of the atomic age based on uranium. It was also at the time the first test bomb to be assembled at Los Alamo in New Mexico and fired at Alamogorda as part of the atomic research Manhattan project.

It can be added that Goodlet was at this period working closely with the overseas scientific research group which concentrated on those developments calculated to bring the war to a speedy and successful conclusion. Fortunately, in atomic research, the allies were ahead of the Germans in the latter's equivalent objectives using heavy water.

Goodlet's work at this time undoubtedly led to his inclusion in the study team sent into Germany at the end of hostilities in Europe to evaluate German wartime research and developments and the extent to which these could be used in the continuing war against Japan and, later, possible peaceful applications.

Incidentally, the efforts of this group resulted in the German expert, von Braun, going to the USA on missile research with the profitable outcome of satellites and space exploration.

After the war this work led to Goodlet being appointed to the Atomic Research Establishment at Harwell, thus emphasising the statement made early in this section that many of the SANF specialist wartime personnel were or became people of high standing in the community.

On New Year's day, 1945, an event occurred in Saldanha which earned two members of the CS84 group the bronze medal of the Royal Humane Society.

One of the hobbies which was becoming popular was the construction of small light canvas canoes for paddling about on the more sheltered waters of North Bay. A keen enthusiast was Wireman McLaren who took his canoe out in good weather. About 100 metres from shore his craft began taking water badly and was soon swamped, leaving McLaren floundering in the sea. He was not a strong swimmer and soon appeared to be in difficulties.

The scene of the mishap was in full view of CS84 from where it was being witnessed through binoculars by the lookout in the telephone post. He immediately reported what was happening to the officer-of-the-watch, Sub-Lieut de Beer who then also looked through the binoculars and saw something else. A shark was visible not very far away. A few months earlier a youth had been taken by a shark while bathing on the opposite exposed shore of the North Bay, less than one kilometre distant. With this in mind, de Beer immediately grabbed the service revolver which was always kept for emergencies in the officer's desk drawer at CS84 and ran down the 100 metres of sloping ground to the water's edge, accompanied by L/S Allemann and Swan Leith who were on duty at the time. These two, discarding their heavy clothing, entered the water and swam to a rock which was awash in the heavy swell but which was the nearest point to McLaren. From here they swam to McLaren and assisted him ashore. De Beer had meanwhile made his way to a vantage point on rocks above the surf from where he could observe the shark and fire at it if it tried to approach the swimmers.


*Leading Swan Molly Leith receiving the Bronze Medal of the Royal Humane Society at Combined Headquarters, Cape Town, yesterday. The presentation was made by Captain F. J. Dean at a parade of Swans. On January 1, this year, Miss Leith swam a considerable distance in shark-infested sea at Saldanha Bay to save the life of Leading Seaman S. G. McLaren, who had overturned a canoe. Miss Leith is now back at her civilian job with the Cape Town Municipality.*

The incident was fully reported in both the Cape Times and Rand Daily Mail in August, 1945 when the Royal Humane society announced the award of its Bronze Medal and Certificate to the two rescuers. *Fig 57* shows Swan Leith receiving her medal in Cape Town some time later, the award being made by Cmdr 'Dizzy' Dean, SANF.

On the eastern shore of Saldanha is the village of Langebaan. During the war this was a Catalina flying boat base from where daily long-distance patrols westward over the Atlantic were made. The planes usually took off before sunrise and returned late in the afternoon or after sunset. Their main object was to check out and shadow U-boats on the surface during the period of enemy activity in Cape waters.

Despite the difficulty of poor road communication between Langebaan and Saldanha there was a fair amount of social contact between the wardroom at North Bay and the flying officers at Langebaan, with frequent invitations to visit one another being exchanged.

On one occasion the writer was invited to stay at Langebaan for a weekend during his monthly free period and accompany the Atlantic patrol on one of its day flights. The invitation was accepted, but within an hour of the visit being due to start on Friday afternoon one of the mine loops developed an electrical fault which necessitated urgent repair work and the consequent cancellation of the long weekend in Langebaan. Early on Saturday morning the Catalina was seen to take off on its routine flight out to sea. It returned very much sooner than usual. It had surprised a U-boat on the surface charging its batteries and it had immediately opened fire on the plane. The aircraft was damaged with a number of bullet holes and returned to base immediately.

What would have been an exciting experience was thus narrowly missed.

One of the difficulties of being stationed in Saldanha, especially in the early days, was the absence of any medical and dental services and a barber. Frequently personnel had to be sent to Cape Town for even minor treatment. Apart from the difficulty of organising the visit and transport at short notice, work on Saldanha was disrupted. However, in due course both a service doctor and a dentist were stationed in Saldanha.

While having one's teeth drilled the dentist would tell the patient how he escaped shortly before from a prisoner-of-war camp overseas by cutting through a lock with a dentist's drill.

The doctor in in Saldanha later became well known for his work in plastic surgery.

From time to time all personnel had to be inoculated against various possible infections. They were despatched for this treatment in batches as they could be spared from their duties.

The problem of the barber was never solved. It remained necessary to find a rating who owned a clipper and, importantly, knew how to use it, or to make the thirteen kilometre trip to Vredenburg, the latter being preferred when transport could be organised.

Generally, the health of personnel at CS84 was extremely good and nobody was seriously incapacitated. Only one officer had to be invalided out of the service, being diagnosed as 'temperamentally unsuited to his duties'.

**10. THE AFFAIR OF JUNE 1, 1944**

The most intriguing and controversial topic about the operation of the minefield and a subject which, in the immediate post-war years, could always be relied on to promote lively discussion and argument between Saldanha 'old timers' was reminiscence about what really did happen on that fateful winter night of Thursday, June 1, 1944.

In passing, by an interesting coincidence, this was also the exact date, to the day, which marked the 150$^{th}$ anniversary of Lord Howe's defeat of the French fleet off Ushant in 1794, which the historians refer to as the 'Glorious First of June'.

Neither at the time of the incident nor over the intervening years has any completely satisfactory explanation been found, apart from a few unreliable conclusions based only on a combination of some vague or indirect inferences. Several possible theories have been advanced. These have been either accepted with reservations or simply rejected. Numerous isolated or inter-related factors have been considered and these have both supported and refuted the various opinions. Information from both British and German sources at the end of the war is also generally inconclusive but does seem to shed a little light on the puzzle.

In fact, one could spend hours studying the various aspects of the mystery and end without any progress. Hence the episode is presented here by first recounting the whole sequence of events exactly as they happened. The combination of prevailing conditions and their apparent influence on what happened is then examined. Finally, an analysis of the circumstances surrounding the incident in their relation to the overall war picture is attempted.

Hopefully, the reader might then be in a position to come to his own conclusions!

The set of circumstances accompanying this unusual occurrence began during the Forenoon of June 1.

As one would expect, the presence of a number of Swans at North Bay provided a good reason for off-duty service personnel at the various bases all over Saldanha to find pretexts for holding evening parties to which a number of girls were always invited.

At about 10.00am – the middle of the Forenoon watch – the telephone post at CS84 received a signal originating from the boom maintenance personnel stationed at the Klipvlei naval barracks. The message stated that there would be a special gathering at Klipvlei that evening and invited a number of the controlled mining Swans to attend between 8pm and midnight.

As often occurred in such circumstances, some of the Swans who wished to accept the invitation found that they had been rostered for duty on the First Watch that night. When this happened it had been accepted practice, subject to the approval of the officer-in-charge, for the watchkeepers to arrange their own stand-ins from among off-duty girls at Swansdown. One of the volunteers to take the First Watch on this eventful night was Swan Sue Labuschagne.

The author also happened to be present during this watch as he had hoped to spend a quiet evening discussing various matters and playing chess with the officer-of-the-watch, in addition to doing some office work.

The First Watch started normally at 8.00pm with the routine take-over from the Last Dog Watch and the usual check of the log, personnel and equipment, while being a cold winter night, mugs of hot coffee were handed around.

Because of some sea swell the PVA amplifiers were not in use, but the land loop was always kept in circuit to balance terrestrial magnetic disturbances.

The watch had been progressing uneventfully for some time when the watchkeeper at the central desk suddenly and unexpectedly reported the first movement of a signature on the galvanometer connected to guard loop 2. This was the centre loop of the three lying on the line between Jutten and Malgas Islands and directly on the normal traffic lane between the open sea and the gate in the inner boom.

Immediately the officer of the watch and the author hurried into the control room and saw the latter part of the continuing signature. To the experienced observer the more significant features of the incoming signal were immediately seen to be (a) the extremely slow movement of the light spot on the screen which, as subsequent event showed, was very important, the earlier P614 submarine tests suggesting a crossing speed of some 3 knots, (b) the fact that no other loops were affected in any way, thus eliminating the possibility of a terrestrial magnetic disturbance, and (c) the signature, when completed, was typical of a medium sized steel hulled vessel travelling very slowly, or at a very acute angle across the axis of the loop.

Because the harbour was always closed to shipping movements after sunset the author immediately put through a phone call to the naval control at Magg’s Cottage. He spoke to the duty officer, reporting what had occurred and emphasised the gravity of the situation, as affecting all immediate actions by CS84 from this moment on, including the likelihood of having to take the initiative and fire some mines within the next hour.

The totally unexpected report from CS84 following many months of inactivity, galvanised naval control into unaccustomed action. All military and SANF units in the Saldanha area were alerted and immediately manned, including the large guns on the hill behind the controlled mining station and the only searchlights just above the northern foreshore which commanded the harbour entrance. The inner and outer night patrol ships were individually warned by radio to keep well clear of the minefield and indicator loops but to maintain maximum vigilance over the mined area.

When switched on, the searchlights revealed nothing but the very dark agitated sea which was carefully scrutinised through binoculars from the lookout at CS84, the atmospheric visibility being good. There was a moderate long period swell coming in from the west. The seasonal prevailing north-westerly wind was making the surface very choppy, the whole area being covered with illuminated, fast moving ‘white horses’. There was about 80% broken scudding clouded cover with some intermittent moonlight.

The conditions were, in fact, typical for a winter night in the Saldanha area. Because of the surface disturbance it was quite impossible to distinguish any small object such as a periscope which could be up to two miles (3km) distant. Even a much larger conning tower would have been difficult to see. In passing through the area covered by the guns and lights, a U-boat might easily choose to hug the southern shore of the entrance ie. pass close to Jutten Island and take advantage of both the darkness and distance.

The mounting position of the searchlights just above water level rather than on the higher hillside slopes nearby, while reducing the field of search from a three- to a two-dimensional problem, had the effect of accentuating water surface disturbances by silhouetting and reflecting them and increasing the depth of the field to be scrutinised in the illuminated area.

Following the intensive initial activity after the first alarm there was a period of relative calm. Several more telephone checks were made to try to avoid the distressing possibility of an innocent friendly vessel being blown up. Also, SANF and RN naval headquarters in Cape Town were informed of what was taking place.

Meanwhile, on the assumption that the crossing had been the action of a genuine intruder, a rough estimate was made of the elapsed time which could be expected before it crossed one of the mine loops 4km further in from the guard loops, ie. in line with Marcus Island. Considering the observed slow speed of crossing the guard loops and allowing for the minimum speed at which it would have to move to maintain navigational stability, directional and depth control under night conditions, while the water shoaled from 15 fathoms at the guard loop to 10 fathoms at the mines, it was concluded that this time could be an hour or even longer. This estimated time may be compared with the ten minutes normally taken by a surface vessel crossing the field in daylight. On the other hand, at any time an intruder could be expected to attempt a high-speed escape to open sea in the opposite direction if he found he had been detected but had managed to evade the defences. While awaiting further developments vigilance was thus also concentrated on the guard loops so as to be prepared for a possible hasty retreat without warning.

*Sue Labuschagne (‘The Angry Female’)*

As is well-known in such circumstances, the remaining period of waiting seemed very much longer than it actually was. Everyone was quiet but tense. The watchkeepers exchanged duties at regular intervals as they normally did. It was while Sue Labuschagne was seated at the control desk that at 10pm events suddenly resumed their progress towards a climax when a signal starting on no. 5 mine loop was called by Sue. This was the loop directly in line with the entrance through the boom net. For details of the scene during these last critical minutes the reader is referred to the Prologue.

The firing lever was pulled at the correct moment. As first mentioned in the Prologue, this set off the largest single explosion fired in anger against the enemy by any of the South African forces in all theatres of WW2 – 18 tonnes of amatol being detonated reflectively off the sea bed in only ten fathoms of water. There were then several seconds of complete silence while the pyrotechnic delays on the mine fuses operated. Suddenly the shock wave of the explosion arrived and took the form of a gradually increasing low pitched rumble, accompanied by the vibration of doors, windows and buildings ashore which was felt in every part of Saldanha. The disturbances lasted for several seconds. The night was too dark and the distance too great to see the explosion from the lookout at CS84.

Naval control was immediately informed by telephone that mine loop No. 6 had been fired. All communications in Saldanha were then running red hot. SANF, Capet Town, was informed as well as senior RN personnel in the Cape.

When the initial spate of communication signals had been dealt with it was possible to turn attention back to what was happening on the minefield. The firing generator was shut down and the remaining field loops set to 'safe' at the control desk. The forming of No. 5 loop was confirmed by a quick electrical test. The searchlights were asked to continue sweeping the area of No. 5 loop, ie. to the south-west of Marcus Island. The inner patrol ship was also ordered into the area with instructions to look for possible survivors, oil or debris in the shoaling water off Marcus. The area was also examined through binoculars from CS84. No wreckage was visible but the surface of the sea around the island continued to be wild and broken, being accentuated by the westerly swell running into the rocky shoaling bottom in the vicinity of the island and causing very heavy surf.

The search and the watch on the guard and the remaining mine loops was maintained throughout the night but nothing occurred which could indicate the cause of the earlier events.

For reasons given later, early morning of the next day, June 2, saw the arrival at CS84 of all the 'top brass' from Cape Town and Simonstown with whom lengthy and detailed de-briefing discussions on the event were held. The state of mine loop No. 5 was electrically tested not only to confirm the firing but also to check whether its surrounding indicator loop was still intact and serviceable.

The remainder of the day was fully occupied writing reports and making arrangements to have the exploded loop re-laid to plug the gap its absence left in the defences.

No wreckage has ever been found although surface waters in the area were patrolled and searched by SANF ships.

*Fig 67: 'Golden Star' and diver search for wreckage after June 1*

If a submarine had actually been present and sustained serious damage it seemed most likely that it would have drifted towards Marcus and sank there, the conclusion being emphasised by the available evidence from its crossing of the guard and mine loops which both suggested it was travelling very slowly with negligible momentum. Because of this possibility, arrangements were later made for Electrical Lieut. Semmelink of Commander Goodlet's staff to search the area with his newly developed underwater metal detectors. A small shallow-draught boat with outboard motor was used, from which the search probe was lowered over the side and connected to the electronic equipment aboard. Unfortunately, the sea close to the island was so rough that Semmelink suffered from sea sickness and the author had to assist him with the operation of the specialised apparatus. The search was very unsatisfactory in that only an insignificant proportion of the area could be examined and then only under very difficult conditions.

Another possibility is that the stricken intruder drifted towards the boom or even through the opening in the net. It is possible that it is still lying on the sea bed in this area.

If it suffered only minor damage and were able to escape, it certainly did not reach the open sea via the normal route between Malgas and Jutten Islands, because the three guard loops there were carefully watched for just such a possibility.

Nevertheless, there is a small chance that it negotiated the channel around the east and south of Jutten. The passage would have been an extremely hazardous undertaking in daylight and very much more so at night in a possibly crippled vessel. However, around midnight the nine-day-old moon would have been over the Atlantic and low in the western sky, so that the rocky profile of Jutten against the illuminated sea would have presented a good silhouette for navigation, either from a conning tower or through a periscope. The undertaking would have demanded much skill and courage on the part of the commander – qualities certainly not lacking in U-boat captains if they felt they had any chance of success or, as here, when faced with extreme necessity. It will be recalled that early in the war there was the exploit of the U-boat commander Prien who penetrated Scapa Flow at night and sank the Royal Oak. At Saldanha we ourselves had already been informed of another daring instance where early one morning a U-boat lying well outside the harbour entrance watched the SANF minesweepers emerge and obligingly start their routine sweep of the channel down the coast to Cape Town. He then followed in safety some distance behind at periscope depth. This incident was recorded in his logbook which later fell into Allied hands. His detailed facts, times and dates agreed exactly with those entered in the CS84 log for the same day, written in when the sweepers crossed the minefield on their way out and headed for Cape Town.

Some light may be shed on the June 1 incident by information from the British and German services. During the meeting and confidential discussion with senior RN personnel on June 2 it was disclosed to the writer and CS84 that the Admiralty had been following the progress of a German submarine southwards from the Freetown area and down the West African coast. On its way south its passage had been regularly recorded by isolated encounters with Allied ships, together with reported sightings of the submarine itself. From these incidents it had been expected to arrive in Cape waters about the beginning of June. Had this important information been given to CS84 only twelve hours sooner it would have saved much worry and indecision on firing the mines. It can be noted that information obtained at the end of the war confirmed that after June 1 nothing further was reported concerning the whereabouts of this submarine.

After the war, from an examination of German naval records it was found that their information included, inter alia, the loss of contact with a U-boat about this time in the South Atlantic area but no reasons were stated and their losses in the Atlantic generally, were heavy.

Piecing together all the available evidence it seems very likely that a submarine entered and was damaged severely enough to force it to sink somewhere in the Saldanha area without allowing any of the crew, or even fuel oil, the time or means to escape. If this is so, its final resting place remains there still.

In contrast to the multi-directional shock wave characteristic of a moored mine, the explosive force of the LMk3ground mines used at Saldanha is directed almost entirely upward by reflection off the sea bed. The most likely damage to a submarine passing over such a mine would be buckling of the plates forming the bottom of the hull, most likely allowing sea water to enter the battery compartment on the lowest deck. The salt water would react chemically with the sulphuric acid of the electrolyte and evolve chlorine gas whose toxic effect would soon overcome the crew.

With LMk3 mines laid in 10 fathoms there is also the strong possibility of a submerged U-boat being rolled over on its side or back and becoming disabled.

It should also be emphasised that no thorough search of the sea bed has been made after June1, 1944.

Before closing this subject, the manner in which the incident fits into the overall war picture might be considered. As stated in Winston Churchill's memoirs on the history of the war the climax of the Battle of the Atlantic had been passed about a year before. While the U-boats had not been actually defeated, they were certainly on the defensive and heavy losses had forced them to change their tactics. They were compelled to operate further away from what had hitherto been the most intensive war area around the western approaches to Europe and Britain. The invasion of Western Europe by Allied land forces was obviously imminent – an operation which would deny the U-boat fleet the use of the Atlantic ports on the French west coast. Hence the technical characteristics of the U-boats had of necessity been improved and changed accordingly, such as the final development of the high pressure hull, first introduced in 1941. Importantly in this case, the design was more resistant to underwater explosions as well as allowing U-boats to operate at greater depths; the snorkel permitted the running of diesel engines when submerged, thus saving and charging batteries and allowing vessels to settle on a shallow sea bed to recuperate. Also, there were already in existence the long-range U-boats which could operate alone for long periods at great distances from their bases without the necessity of a mother ship or port facilities.

The German submarine was thus becoming just as important in a reconnaissance or surveillance role, gathering intelligence, as it has been as an instrument of aggression. It was also being used for surreptitious landing of specialised personnel on remote coastlines, as had already happened in South Africa. It is quite likely that the intrusion at Saldanha was an episode in a patrol of this nature, especially as there was little or no merchant or naval shipping lying at anchor in Hoedjies Bay at the time, to make the risk of an incursion worthwhile. It may have been the intention of the commander to lie low and rest his crew for a while after a long patrol from northern waters before entering the more active area of traffic convergence off the Cape. Alternatively, he may have been resting at the extreme end of his patrol before returning north.

Whatever its reasons were, at the meeting on the morning of June 2 the author was left with the very strong impression that the U-boat being followed by the Admiralty was not engaged on an aggressive mission, avoiding rather than seeking contact with shipping on its route.

It should also be remembered that at this time the Germans were intent on gathering any information from any source around the globe which could give them some hint, however slight, regarding the time and place of the approaching invasion of Europe being planned at the time under the code name *Operation Overlord*.

As it transpired, the affair at Saldanha took place only five days before D Day on June 6 which was itself timed for the full moon period to provide maximum light during the short summer night and to assist the complex landings as already noted. The intrusion into Saldanha thus occurred during the same lunation as the invasion of Europe but, being several days earlier, the U-boat commander had the nearly full waxing moon low in the west behind him while entering in the late evening. Having earlier moved inward very cautiously he was then in a strong position to beat a hasty retreat at any time using the silhouetted land profile for navigation at higher Speed. No doubt he would have been aware of the presence of the minefield but was unlikely to know its exact position, particularly at night. He was, therefore, probably probing the defences during his very slow entry period and had been alerted, if not alarmed by the searchlights being turned on. He would also have known that the choppy surface of the water would have prevented his periscope being seen from the shore in the general darkness.

Closing this episode, the possibility of a Japanese submarine being involved can probably be discounted. At this stage of the war the Japanese were too much involved with the Americans in the widespread Pacific theatre to be directly concerned with what was happening around remote South Africa.

The events of June1 should not be finally closed without a brief look at some of the important and originally secret correspondence relating to this history-making episode in the annals of the SANF.

For example, the following is an extract from a letter dated 15 August 1944 from the Admiralty, London to the Commander-in-Chief, South Atlantic:

*...The reports on the firing of certain controlled mine loops at Saldanha Bay and the subsequent search forwarded under cover of your (ref) dated 22 June 1944 and your (map) dated 16 June 1944 have been read with considerable interest and Director of Torpedoes and Mining considers that the action taken was correct and fully justified by the record of signatures obtained.*

*This is the first time when a controlled minefield has been fired in danger by female watchkeepers and DTM feels that they should be congratulated on the efficient manner in which they carried out their duties.*

*It is to be hoped that history will disclose that some definite result was obtained and that failing a kill the firing of these loops served some useful purpose*

*(sd) G A Barratt*
*for Director of Torpedoes and Mining*

And that was how Swan Sue Labuschagne became known as *'The Angry Female'!*

**11. THE FINAL DISPOSAL OF THE MINEFIELD AND WINDING UP**

It seems fitting that the eventful story of the Saldanha minefield should conclude with an account of its final destruction by exploding it following the end of the war operations in Cape waters.

Those readers acquainted with the history of World War ll will recall that during the early months of 1945 on the continent of Europe, Germany was reeling in disorder under constant attack on both the western and eastern fronts. It was daily becoming more apparent that her final defeat with the consequent cessation of hostilities in that theatre was imminent, probably before the northern summer.

Against this background it was decided during the early part of the year that Saldanha Bay had served its purpose as a defended anchorage and its further use as such was no longer necessary and should be discontinued. The order was, therefore, issued for all controlled mining to cease, watchkeeping personnel to be released and the minefield to be destroyed by firing it in situ. It was also the intention that the closure of Saldanha should release some of the specialised personnel for further service in the continuing prosecution of the war against Japan which was then expected to be confined to the Far East and Pacific zones.

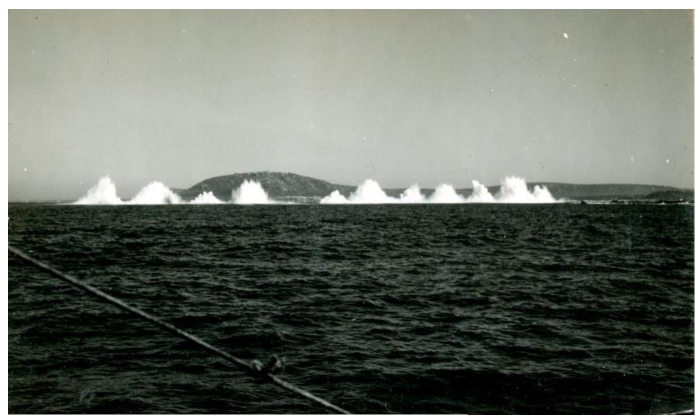
And so, after carrying out all electrical tests for the last time, the Saldanha controlled minefield was blown up by firing all the eight loops, one at a time, over a period of about one hour during the forenoon of Friday, April 6, 1945 in perfect, windless sunny weather with a calm sea.

*Fig 68: Swans on the day of their departure*

As a parting gesture and to show appreciation of their thousands of boring and uneventful hours of watching spots of light on the galvanometer screen, it was agreed that the actual firing might be carried out by a few of the former Swan watchkeepers. The Swans had already ceased their watchkeeping duties and had departed from the North Bay naval barracks after a farewell tea party at CS 84 on March 15th before taking up other duties in the Cape. *(Fig 68)*

Consequently, special arrangements had to be made with the naval authorities in Cape Town and Robben Island for some of the girls to be granted leave to be present and to participate in the memorable event. Their group with some of the remaining personnel at CS 84 are shown in ***Fig 69***. For obvious reasons they became known as *'The Firing Squad'.* Included were Swans Scholtz, Kirby, McLeod, Leith, Merryweather and Dexter. Also shown are Sub-Lieut de Beer, administrative official for the occasion, Wiremen Allemann and Buchan who were in charge of the mechanical and electrical plant at the station on that day and the writer as the Mining Officer-in-Charge of technical services.


*Fig 69: The 'Firing Squad'*



*Explosion of two of the loops*

All groups of mines fired correctly, providing a spectacular display with many columns of water being thrown about 100 metres into the air, each emerging through a white haze on the surface of the sea caused the by initial shock wave reaching the top before the upheaval of displaced water.

The show was witnessed by a flotilla of small craft carrying 'top brass' and visitors assembled at a safe distance for the occasion. Among many others those present included the Acting Minister of Defence, Commander F C Sturrock, the Commander-in-Chief South Atlantic, Vice Admiral Sir Robert Burnett, the Chief of the General Staff, Lieut-General Sir Pierre van Ryneveld, the Director General of the Air Force, Major General C Venter and the Director of the SA Naval Forces, Capt Dalgleish.

As well as in other news media the event was reported in the Rand Daily Mail of May 19th, 1945. At about the same time it was also featured on film for public showing throughout South Africa as an item of news in the *African Mirror* under the title *'War Secret Revealed'.* The writer will always be indebted to the proprietors of the *African Mirror* for the donation of a 16mm black-and-white copy of the memorable documentary item, recording the many enormous rising spouts of water as well as some other views of Saldanha.

A few hours after the mines were destroyed there was on that quiet, warm, windless and sunny afternoon a definite feeling of emptiness, sadness and loss among the remaining few controlled mining personnel. There grew a painful realisation that the object on which so much continuous time, instruction, energy and absorbing work had been concentrated for over two years and which had been instrumental in bringing about so many friendships, unforgettable experiences and the acquisition of so much specialised knowledge for the group in new and unaccustomed disciplines, was suddenly no more. From this time on there was nothing to do; all uninterrupted responsibility and urgency had ceased; the phones were quiet; the log books were closed and filed away for the last time; radio Lucy was switched off and the doors of the control and power huts were closed and locked for the first and last time.

Then the few technical and administrative members of the Firing Squad silently walked down the 100 meters to the North Bay Barracks, each quietly occupied with his own thoughts about the closing war and the return to civilian life. What did the future hold for each of them?

Needless to say, the detonation of about 100 mines, ie. very much more than 100 tonnes of amatol, along a 3km strip of sea at a depth of 10 fathoms produced literally mountains of fish. Indeed the event is reputed to have seriously harmed commercial fishing in the area for many years afterwards. Be that as it may, immediately after April 6, Saldanha and all surrounding districts many kilometres away lived off the huge supply of high quality fresh fish for many days.

*Dead fish after explosions*

The destruction of the minefield and in a similar manner, the disposal of discarded mines by under-water explosion on previous occasions, yielded some interesting information on the effect of such detonations on fish generally. Most of the fish required about half an hour to rise to the surface where they then floated on their sides. Those in the immediate vicinity of the explosion were, without exception, disembowelled. Those further away were killed but apparently undamaged. The fish up to about 500 meters away, also lying on their sides, were stunned only, some remaining in their inert condition for nearly one hour. In many instances this group became aggressive when an attempt was made to grip them by hand. They recovered on being touched and snapped at the fisherman's hand. In this way several minor injuries were sustained by members of the mining crew while collecting fish from the Spindrift's dinghy.

Blowing up the mines also provided final proof and dispelled any doubts that all sections of a minefield would have fired correctly at any time during the previous 26 months, had an enemy attack occurred, apart from the event of June 1, 1944 already recounted.

A far less spectacular sequel to the occasion was the intrusion of bureaucratic red tape by the final instruction received from army and naval stores for the mining officers to submit an inventory of all non-consumable mining plant and equipment issued to controlled mining from the end of 1942 and still nominally in stock. Also acquired was a separate list of those 'consumable' items written off as a result of blowing up the minefield. It was inevitable that this latter escape loophole would be fully exploited to balance the books and account for the great variety of items which had obviously disappeared over the years, such as blankets, clocks, portable electric test instruments, camp beds etc.

Included in the list submitted for items blown up and written off was ...one bag of tent pegs!

Also at this time, the instruction was received that all maps, documents, files and records relating to technicalities, operation and administration of the field should be destroyed by incineration. Reading through this mass of papers again was a time-consuming but interesting occupation.

By August 10, 1945 nearly all the controlled mining personnel had been released and had left the Saldanha area for service elsewhere.

On this date, the writer went to Cape Town to report to Lieut-Cmdr James, then in charge of technical service, that all work in Saldanha had been completed and that he would be going on leave to Johannesburg that night.

James mentioned that, with the closure of Saldanha, the centre of our activity was to be transferred to the Far East in the continuation of the war against Japan. He asked if the writer would be prepared to volunteer for further technical service in that theatre for laying or clearing minefields. The suggestion was agreed to provisionally.

However, within a day or two it was announced that the Japanese government had accepted terms of surrender on the 10th of August, the day after the second atomic bomb had fallen on Nagasaki, but the Japanese fighting services were still reluctant to capitulate, presumably until the eventual status of the Emperor Hirohito was established.
On the second of September, while the writer was still on leave, the well-publicised and photographed armistice was signed under the main guns on the foredeck of the *USS Missouri.* This was followed by the formal ceremonial surrender at Singapore on 12th September.

Because of the changed circumstances, on returning to Cape Town early in September the writer's final release was immediately organised, the details and actual documents being prepared by Swan Freda Crews. Release was granted on the 21st September, enabling the writer to leave Cape Town the same night.

Several of the younger members of the controlled mining group remained to make a career in the SANF after the war. Others returned to their interrupted studies. Generally, however, the remainder returned to their pre-war occupations, into which they were successfully re-absorbed. The moratorium on servicemens' payments and debts introduced in commerce and industry during the war years was an exemplary move and enabled volunteers to return with the minimum disruption to their peacetime lives and careers. Many firms commendably made up the difference in pay between service and civilian remuneration to enable members of their staff to join up without suffering financial hardship.

Despite the basically favourable conditions there were nevertheless some anomalous situations, not only in the SANF but in all the services. For example, the writer was acquainted with one firm where a young staff member was an office boy in charge of the stock inventory at the outbreak of war. He was promoted to Lieut-Colonel during a very successful military career and with understandable difficulty returned to his old job at the end of the war.

Fortunately, such cases were comparatively rare.

A quite inexplicable case was that of one of the officers who trained with the writer at *Unitie*. Many years after the war he was on the streets of Johannesburg as a hobo – his own choice.

An organisation which greatly cared for ex-service personnel was the DSDC – the Discharged Soldiers Demobilisation Committee. They did much to ensure that all personnel were rehabilitated into civilian life as smoothly as possible by providing financial assistance where necessary.

Educational institutions offered favourable terms to students in the resumption or the start of their studies and did much to assist in transitional difficulties.

All members of the controlled mining group qualified for the war medals. These included, interalia, the contentious Africa Service Medal (for undertaking to serve anywhere in Africa, also known colloquially as Ouma's Garter), the 1943 Medal and the Victory Medal.

*Vale! Spindrift*

After the war, Spindrift was put into retirement. It was renamed the *Skilpad* and for years lay tied up in Durban. It had deteriorated and was leaking so badly that it eventually sank in bad weather. It was finally sold for scrap. In addition to ending a useful, interesting and varied career this closing act was like the funeral of an old and trusted friend and severed a last link with World War II.

## 12. MAIN DATES: CONTROLLED MINING, SALDANHA

*Mid 1942*
Decision to lay minefield at Saldanha

*September to December 1942*
First technical and watchkeeping personnel recruited and given disciplinary training at *HMSAS Unitie*

*January 1943*
Initial technical training of Controlled Mining personnel at Unitie.

*January to March 1943*
Minefield planned and laid at Saldanha.
SANF personnel billeted and trained aboard *Manchester City.*
Loops commissioned as laid
First tent encampment at North Bay

*March 1943*
Minefield completed
Routine watchkeeping, regular testing and reports started

*April 1943*
North Bay Barracks completed and occupied

*August 1943*
Land loop laid, tested and commissioned

*November 1943*
Special loop tests with HM Submarine P614, including analysis of results and report to RN

*January 1944*
Photo–voltaic amplifiers on indicator
Loops installed, tested and commissioned

*April 1944*
First Swans arrive in Saldanha

*June 1, 1944*
Possible hostile intruder on minefield. One loop fired in anger

*January 1, 1945*
Swan Leith and Wireman Allemann saved Wireman McLaren from drowning. Eventually awarded bronze medal of the Royal Humane Society

*March 15, 1945*
Farewell party on departure of Swans

*April 6, 1945*
Minefield blown up

*August 10, 1945*
Winding up of mining activities completed
Records destroyed
Last personnel departed
Buildings locked up

*September 22, 1945*
Writer released from service

## 13. WRITER'S POSTSCRIPT

Five years after the end of the war, I was happily able to spend a short holiday in Saldanha, I had reserved accommodation at the Old Homestead Hotel situated on the lower slopes of the hill overlooking both the village and the original fishing harbour. It will be recalled that the back of the same hill was also the site of one of the mine loop transmit beacons in 1943.

On the first day I set out on an exploratory walk to North Bay, prompted by feelings which were a combination of curiosity and nostalgia. On the way I passed through the well-remembered, low-lying, open ground at Klipvlei to the south-west of Saldanha township. It was here that we had found so many of the small stone-age artefacts. The day was a typical Saldanha one with bright sunshine, a cloudless deep blue sky and, being early spring, there were masses of red poppies in every direction.

At the top of the sand dunes bordering the end of North Bay I stopped to look at the little brick chamber which had housed the terminals of all the cable tails. It was still there but it was filled with wind-blown sand and the wood door was broken and left hanging on only one hinge.

Leaving the shelter of the hill and approaching North Bay Naval Barracks, I was greeted by the usual fresh southerly wind blowing across the wide sweep of the harbour entrance and carrying with it the strong and unmistakable smell of the bird guano from the islands.

My first impression of our wartime home was the pervading air of neglect and general dilapidation among the buildings and their environs. The indigenous scrub had taken root everywhere; fences were broken down in many places, while the galvanised wire strands were tangled, broken or rusting leaving several of the posts lying flat on the ground.

On most of the buildings the corrugated asbestos roofing had chafed and become loosened around the fixing screws, allowing individual sheets to rise and fall fitfully in the breeze. This was the only sound and consequently, it added to the impression of total desertion. Patches of white paint were flaking off the walls of buildings; drains were covered with sand and rubble and overgrown with weeds. Paintwork generally was faded, cracked and worn; steelwork and water tanks were rusting; windows, where not actually broken, were almost opaque with the accumulation of dirt over the last years.

Down at the North Bay shoreline nearest the barracks, long stalks and strands of dark brown kelp, undulating in the low tide, had reclaimed the swimming pool which Sub-Lieut de Beer and I had cleaned so laboriously several years before.

Turning southward up the gently rising 100 metre long pathway towards CS84 I saw that the white painted stone edge markers, placed to guide the night watches, had been scattered and the walkway itself was overgrown with weeds and criss-crossed with the deep rainwater runnels.

Arriving at the concrete power and control buildings, first impressions were much the same as elsewhere. The ornamental bird bath, fences and stone-pack retaining walls were almost completely demolished; everything was covered by the unchecked natural plant growth.

The scene was in such striking contrast to that of the uninterrupted activity of a few years before. In those days watchkeepers arrived with cheerful chattering, reported regularly for duty, relieving others to return to barracks, while technical and off-duty personnel were either busily engaged in testing and maintenance of equipment or, during daylight hours, casually gardening, cleaning or painting.

Looking around in silence on such change and desolation and thinking rather wistfully of those earlier war days, I could not help recalling some applicable lines from Hervey Allen's well-known novel *Anthony Adverse.* They are those appearing in the chapter headed *The Swansong of Romance:*

*'Oh, there's never a dove in last year's nest*
*Or a swan to come back to me...'*

With these thoughts and recalling the navy's stirring events of the war years which came crowding back in my memory, including the life-long friendships made in Saldanha and the *espirit de corps* developed in our self-contained, tightly-knit group of the SANF, I returned to a late but very enjoyable lunch at the Homestead Hotel.

*July 1988*

*The author of this report:*
*Dr HEJ Symes*

*<u>Transcriber's note:</u>*
*A hand-written draft of this article was found amongst the papers of Dr HEJ Symes in 2011. When reading it, it became evident that it was of great historical interest and this first-hand account of the important work done at Saldanha to protect shipping in the south Atlantic should be made available to his family as well as to military archives in both South Africa and the UK.*

*The transcription was undertaken by the author's daughter, Elizabeth Broekmann who is very grateful to another of Dr Symes' daughters, Jean, who helped locate some of the diagrams which appear in the article and who gave the support and encouragement needed to get this article published as a tribute to our father.*

*The photographs were taken from two albums which were also found amongst his possessions.*

*Elizabeth Broekmann (nee Symes) 2019*

***The author has put the following 'Publisher's Note' on the inner cover of one of the two photograph albums he put together:***

*These two albums are intended to put on permanent record our war experiences and activities (both official and otherwise!) while part of that extraordinary organisation, the SA Naval Forces, from September 1942 until September 1945.*

*The photographs, cuttings and extracts from letters record, in brief, the story of the controlled mining section of the SANF at Saldanha Bay, hitherto very much on the secret list.*

*As Technical Officer, Mining Officer, O/IC Controlled Mining Station and O/IC Mining Base (all simultaneously!), I was fortunate in having a very broad view of our activities which, it is hoped, have been brought together here in an interesting manner.*

*Our history has two principal periods, viz., 'BS' (Before Swans) and 'AS' (After Swans) datum being April 7th 1944, after which date, needless to say, our experiences and lives were very different.*

*In looking through the following pages, may the casual observer partly lift the veil of war secrecy and revel in the delights of Saldanha Bay!*

*HEJ Symes*