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OPERATIONS PROBLEM IV-1933-SR.

TACTICAL PROBLEM V-1933-SR

Comment upon battleships, air forces, cruisers and train
of BLUE - general remarks upon other phases in Operations
Problem IV and Tactical Problem V.

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by

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INTRODUCTION

A general resumé of BLUE-ORANGE Problem IV and Tactical Problem V which resulted upon the different nights is given in letter of 6 December 1933 to the President Naval War College. The various statements of fact, opinions and observations are shown in Enclosures "A" to "N". And, with this enclosure "O" will be found the comments upon type of ships, weapons and special incidents or set-ups as seem pertinent to the Research Department. It appeared desirable to have one officer (Commander Hoey) handle the entire ORANGE operations who took part in them. Herein are comments upon all types and tactical details which present the ORANGE side of the picture. His discussion upon the air attacks, submarine operations and light force engagements on 11 and 15 December are of special value to those of BLUE studying the problem of an expedition to the Western Pacific.

Carrying out the general scheme of two years, Captain Taylor concentrated upon the uses of destroyers and submarines of both BLUE and ORANGE. In all games he specialized upon these types and with emphasis upon the uses of and results attained with torpedoes. It is believed that his broad experience in command of submarines and destroyers during the World War and since makes his comments especially valuable.

With all the above comments as a background, an attempt is made to briefly note the salient points on the types not already specially covered - battleships, air forces, cruisers, train and auxiliary types. Also, under general remarks, some points will be noted that appear pertinent to the general comment of the Research Department.

(a) Types of Vessels.

Battleships) BLUE had 15 BBs in the Expeditions -
and) as modernized and in their 1933 condi-
Battle Cruisers) tion. These include the 3 MARYLANDS,
2 CALIFORNIAS, 3 NEW MEXICOS, 2 PENN-
SYLVANIAS, 2 OKLAHOMAS, 2 TEXAS and
ARKANSAS.

ORANGE had 6 BBs - 2 NAGOTAS, 4 HYUGAS
and 3 CCs of the KONGO class.

Comparison of foregoing. If all are in the battle line de-
ployed against each - fleet against fleet - we may expect BLUE to
have a life of 254.8 as compared to 138.6 for ORANGE. In main
battery guns, BLUE has 160 to ORANGE 88. In range, all of ORANGE
are plus 30,000 yards, whereas BLUE has 32 guns minus 22,000 yards
and 128 plus 33,000 yards.

In speed, ORANGE has the edge over BLUE. Her 3 CCs, 26 knots,
and minimum BB speed of 22.5 knots. BLUE has 5 BBs of 20.5 knots
and 10 of 21 knots.

Further comparisons as to armor, radius, aircraft, etc., are
not gone into in this analysis.

BLUE is distinctly superior to ORANGE on paper with all assumptions made as to 100 per cent condition and "readiness", battle line against battle line, especially considering the vulnerability of the ORANGE CCs to penetrative hits. It is estimated that the ORANGE battle line in material fighting strength is not half of BLUE.

Operations in Problem. From the beginning of BLUE's overseas expedition at 1400, 30 November, from Hawaii, the battleships of BLUE in his cruising disposition played but little part of interest until the night of 10-11 December. They occupied their positions upon the inner circles of BLUE's circular formation, were under no strain at the formation speed of 13.5 knots, zig-zagged, and presumably kept ready for day submarine or air attack. Their position enabled them to fire up to 12,000 yards and to be free to maneuver without endangering their own vessels. It is possible that they were too far advanced as action came to keep out of torpedo range. Their planes were aboard. Up to 9 December they were in no danger of attack, as BLUE had thrown off the ORANGE scouting force.

At 0600, 10 December, 6 BLUE BBs were sighted by an ORANGE cruiser plane which was over the BLUE Fleet. Before being shot down, it gave ORANGE full information of BLUE. From this time on, the BLUE battleships were targets of the ORANGE air, light and submarine forces. On the same night - 10 December, the BLUE formation was pierced by the ORANGE cruisers and destroyers. Searchlights and star shells are used. A spirited action took place from 2215 until dawn. In Cruising Disposition 2 (Enclosure E) and with his 21 tankers in position to fuel at daylight, BLUE hardly expected any night attack. ORANGE drove home his cruiser-destroyer attack and menaced the BLUE formation.

In this action (already covered by Captain Taylor and Commander Hoey) the battleships became the objective of ORANGE. By 0319, the OKLAHOMA had received one torpedo hit. And, in aiding the BLUE CAs - heavily engaged by ORANGE cruisers, BLUE BBs opened main battery fire with all planes on board (also on cruisers) lost as a consequence (the BLUE spotting force). Searchlights and star shell were used by BLUE BBs, and ORANGE torpedoes were fired at the big gun flashes. Luckily, for the battleships, changes of course of the formation, ORANGE casualties in cruisers and destroyers and the approach of dawn, kept the battleships clear of further attack that night. They forced the ORANGE cruisers to retire and the OKLAHOMA was the only battleship casualty - with 1 torpedo hit.

On the following morning - 11 December, with an ORANGE aircraft torpedo attack threatening the BLUE formation, the BLUE BBs opened out to 2,000 yards distance and for them the destroyers made smoke. BB-37 was hit by 3 torpedoes and BBs 38, 43 (PENNSYLVANIA and TENNESSEE) by two torpedoes each. This attack netted further damage also with bombs upon the BLUE carrier CV-4 (loses flight deck, speed 17 knots). More comment will be made upon this attack under Air Operations.

From now on - with 4 battleships damaged by torpedo hits - ORANGE forces near the formation and an ORANGE submarine inside the BLUE formation, the situation became worse. On 12 December BLUE knew that ORANGE submarines had contacted his carriers and CAs and might get in on his BBs. The BLUE formation was surrounded by ORANGE forces (although only the ORANGE CCs were near enough to have any bearing. No ORANGE BBs are in this area). For the next two days and nights ORANGE made threats with his submarines and air force, but the BLUE BBs received no punishment. However, the ORANGE CCs ahead of the BLUE formation ran foul of BLUE submarines and CC-3 (the HARUNA) got 2 torpedo hits, reducing her speed to 16 knots.

Coming to 14 December, the position of the BLUE BBs becomes all the more critical. At daylight, the battleships are in their assigned sectors, the OKLAHOMA with 3 torpedo hits and the PENNSYLVANIA and TENNESSEE with two hits in each. Land near to the southward hampers BLUE and a threat arises of an ORANGE air attack. Besides (and unknown to BLUE) his formation has 7 ORANGE subs ahead and 8 astern. BLUE is enveloped by ORANGE forces. The ORANGE bombing attack from KAPINGAMARANGI ISLAND failed, but by 1800, this same night, ORANGE is ready for his major night offensive. The general features of this action have been brought out by Captains Coffey and Taylor and Commander Hoey. It resulted in one of the greatest night engagements played at the War College in some time.

Of great interest in analyzing the situation is the "picture" that existed. Here is the BLUE Cruising Disposition No. 2 - at night, 2250, full moon near meridian, high visibility, wind 5 from Northeast and a moderate sea, approximate positions Latitude $1^{\circ} 30'$ and Longitude 152° . It is December! Both sides have had four days and nights of intensive strain. The casualties to both have mounted up. The BLUE battle line of 12 BBs is cut down considerably by 4 crippled battleships, each with one or more under-water holes which remain unchanged. Due to this damage, BLUE's battle line formation speed is now reduced to below 16 knots (Diagram 9 presents the set-up before further casualties happen).

During the first two hours, until after midnight, the entire area of the formation is full of smoke, gun flashes, searchlights and fire shell illumination. Added to this were the flares of the ORANGE aircraft over the formation. The OKLAHOMA, NEVADA and ARIZONA were in the thick of the melee. Torpedoes from both BLUE and ORANGE barely missed. The change of course by the BLUE fleet to 235° brought the fight astern. The battleships' main batteries were used against cruisers and destroyers. BLUE BBs were barely missed by the ORANGE torpedo salvos. Ranges were from 3 to 7000 yards. It became a melee. By 0150 the sky became overcast and normal night visibility. The battle area was covered with smoke from smoke screen, oil fires, funnel and gun gases, limiting visibility to only 500 yards. Amid this the ORANGE light forces continued their offensive against the battleships, carriers and train. Battleship Division II (the ARIZONA, NEVADA and ARKANSAS) was attacked by the Western ORANGE attack group which had broken through the screen (Diagram 13). They fired torpedoes at the BB searchlights - 8000 yards, but missed. By 0245 most of the night action was over. During it the BLUE battleships suffered additional damage, resulting in the sinking of the ARKANSAS and 7 other BBs damaged (details shown in Commander Hoey's comment).

General Notes on Battleships.

(1) Their damage from torpedoes cannot be repaired west of Hawaii.

(2) The use of their main battery at night puts all their spotting planes out of commission.

(3) With smoke gases and fire control under searchlight or star shell illumination, the efficiency of their gun fire is greatly reduced.

(4) Aircraft torpedoes and bombs offer a serious threat to the BLUE battleship force in an overseas expedition. If 1000# bombs produce greater damage than now allowed for in War College Rules (1 hit up to 1932 being equivalent to 2-14" penetrative hits, now being 0.54), the condition of the BLUE battleships in this problem might have been much worse.

(5) It is questionable whether the battleships at night would have been shown up by aircraft flares as readily as permitted in this game.

(6) ORANGE battleships remained intact and played no major part in the game. They were too far away.

(7) ORANGE battle cruisers also had no important part in the game. They might have had the game continued. But, as frequently happens, the HARUNA was caught by a submarine torpedo and retired to the Northwest.

(b) Air forces. BLUE had four carriers - RANGER, SARATOGA, LEXINGTON and LANGLEY plus WRIGHT tenders and 396 planes plus 36 in tenders.

ORANGE had 4 carriers and 334 aircraft plus 82 Army. In general, BLUE was superior in aircraft, particularly in VF and VS types, but if ORANGE can employ Army planes the two air forces are about equal.

In addition, BLUE had the AKRON and MACON for scouting purposes.

In the game as it proceeded, air forces took a prominent part in BLUE's patrol operations from the sortie to the end. During the first week there were no air force clashes with ORANGE, except in the loss of the ZR-5 (the MACON) near Rongelab on 2 December and the escape of the ZR-4 on 6 December by climbing above a cloud ceiling.

BLUE had a combat patrol over the fleet guide, with 4 VS or VT patrolling Sector #1 and 1 VS each in Sectors #2 and #3. The Western Scouts made 4 flights per day of 11 VS, each scouting the advance sector. The Eastern Scouts consisting of 7 VT made 4 flights also. These 3 groups called for a total of 144 flights daily from CV-2, 3 and 4. CV-1 was maintained in condition of readiness - 2 on leeward side of its assigned area with a ready protection of 6 VBs loaded with 2-500# bombs for each and 9 VFs. They contacted enemy submarines and reported them.

The various details of the daily BLUE and ORANGE air operations are given in the History of the Chart Maneuver (Enclosure K). Their general plan and the results throughout the problem may be found there. The movements and picture of the loss of the AKRON and MACON are matters of great interest in future studies of lighter-than-air aircraft. The comments of Commander Hoey and Captain McCrary (the latter of whom was the first commander of the SHENANDOAH) are of great value.

On 8 December at 0623, a BLUE plane in Sector #2 reported an enemy cruiser, which was the beginning of air activities. Following this, different actions took place between BLUE and ORANGE planes. An ORANGE cruiser plane at 0650 reported BLUE submarine. These plane reports enabled the ORANGE C-in-C to plot the location of the BLUE main body and plan the attack.

In the first night attacks - 10-11 December - planes were not used. But the following morning, at 0600, 11 December, ORANGE made their first big bombing attack on the BLUE main body with 80 VF, 40 VB with 1000# bombs, 56 VT with torpedoes, 8 VT with smoke making apparatus and 8 VB for scouting. (This attack was executed by the ORANGE Comairon, Captain McCrary). Its objective was the BLUE BBs and CVs. BLUE subs reported this attack coming in. Against it BLUE launched at 0730, 99 VF and 36 VS to oppose it. The ORANGE VT attack from the East, behind a smoke curtain, got the OKLAHOMA with 3 torpedoes and the PENNSYLVANIA and the TENNESSEE with 2 torpedoes each. The bombers caught the

CV-4 (the RANGER) and put its flight deck out of commission. As compared to this, BLUE's counter attack of 40 VT with bombs destroyed the flight decks of both the ORANGE CV-2 and CV-4. Due to this (an important, interesting fact), the ORANGE planes, out of gas, tried to reach the other carrier (CV-3) with flight deck intact, but had to land in the sea (wind 5, moderate sea) and were lost - 20 VB, 12 VT and 4 VF.

On 13 December, from the rear of BLUE formation, ORANGE CV-4 launched a bombing attack of 40 VT and VB against BLUE CV-2, but were driven off by 36 VF with about 50 per cent casualties.

Up to the night action of 14 December, ORANGE was using his two damaged flight deck carriers as cruisers. His air attack this day of VPs from Kapingamarangi Island failed to make contact or reach their objective and failed.

In the night action that ensued ORANGE cruisers sent up a VS plane with flares to search. They illuminated the BLUE BBs. These flares were of great value to ORANGE in showing up parts of the BLUE formation.

On the BLUE side, planes were not used at night. The carriers outside the formation suffered from contacts with ORANGE light forces and subs. The damaged RANGER was on the cruiser circle. The other 3 BLUE CVs started the action with flight decks intact. But the RANGER was sunk by ORANGE Desdiv 18 in her mix-up in the cruiser engagement. The other BLUE carriers took no part in the engagement, and luckily escaped damage from collision, torpedoes or gunfire.

The ORANGE air operations using flares throughout the night action produced important results and did it unopposed. He also continued his aggressive air operations at dawn after the night action. 18 ORANGE VPs attacked the BLUE BBs, damaging 1 BB 40% A.W. and 1 BB 24% U.W. This major air attack by ORANGE was met by BLUE in a counter attack of 57 VF which destroyed all of ORANGE VFs. But the ORANGE VBs continued on and got a BLUE BB by torpedo and sunk a BLUE CV (the LEXINGTON). In the meantime, the flight deck of ORANGE CV-3 had been ruined and set on fire. Added to this, a hurricane came and slowed down all air and other operations. With such conditions and weather, the game was called on 16 December at 1800.

ORANGE at the end had only 1 small CV undamaged as compared to 1 large BLUE CV and 1 small CV - 150 ORANGE planes against 261 of BLUE.

Notes on Air Forces.

(1) The AKRON and MACON were lost without affording any information of value to the BLUE C-in-C. They proved most vulnerable to attack by planes.

(2) BLUE's planes were valuable in patrol around his formation and keeping submarines down.

(3) The BLUE carriers outside of the formation were more independent to maneuver. Their flight decks as usual were easily damaged. Their main battery guns were not used.

(4) The loss of BLUE's spotting planes from his BBs due to gun fire was serious, considering a future battle line action.

(5) The ORANGE planes were valuable in scouting operations and made aggressive attacks upon BLUE carriers, cruisers and CVs. The coordination of his CV planes and shore-based craft might have been more serious to BLUE than it developed.

(6) ORANGE using planes with flares in the night engagement of 14-15 December added much to his aggressive cruiser and destroyer attacks and made a hole in the screen.

(7) ORANGE carriers had no DD escort, but were protected by CCs.

(8) ORANGE planes made 8 torpedo hits as compared to 14 sub hits. Their torpedo and bombing work was very effective.

Cruisers and Train.

BLUE had 16 heavy cruisers (8-inch type) of 10,000 tons and 8 light cruisers of 7500 tons. ORANGE had 12 heavy cruisers and 11 light cruisers plus 7 in the China Squadron.

In general, BLUE was superior in heavy cruisers - as 16 to 12, and in life 75 to 52. Speed about the same - 32.5 to 33 knots. BLUE had greater cruising radius - ORANGE cruisers had more torpedoes.

In light cruisers, ORANGE was superior. Four ORANGE CLs are of 8500 tons and superior to any BLUE cruisers, but BLUE's OMAHAS are superior to other ORANGE cruisers.

In aircraft, ORANGE in her CLs has 22 VS planes to BLUE's 16 VS.

In the problem the operations of cruisers is described in the comments of Captain Coffey and Commander Hoey. Cruisers - heavy and light - took part in all scouting operations after BLUE fleet left Hawaii. They were of great importance to BLUE in his cruising disposition and the backbone of his defense against the ORANGE night attacks of 11 and 14 December. In many rôles the cruiser was the most versatile type of vessel on both sides. A complete report of their work and accomplishments would bring in all phases of the problem. It was a plane from ORANGE cruiser CA-37 on 10 December that gave the ORANGE C-in-C his first definite information of the BLUE main body since 30 November. Also, for ORANGE, the cruiser in attempting to get information sacrificed 2 CLs and 1 CA from bombing attacks. Their scouting line on 10-11 December had 9 CLs and an attack group of 6 CAs, and these CAs succeeded in penetrating the BLUE picket line on 10-11 December.

In this night engagement of 10-11 December (reference to Diagram 20 - Move 17), it is of interest to note that the wind was 4 from East and a moderate sea. It will be seen that the ORANGE CAs were menacing the BLUE formation, also that ORANGE had a formidable scouting line of CLs to the northwest. This particular situation from 2200 on through the night offers a field for special studies of "Cruiser doctrine" at night. Except for the following night action of 14-15 December, it is believed that this phase of the game may offer more different set-ups than in any other game since 1931 at the Naval War College.

After this action the cruisers on both sides were most active up to the start of the final major night offensive - 14 December. In Diagram 9 (Tact. Prob. V), BLUE has his cruisers disposed on the #2 circle to defend his BBs with his train near the center of formation. In this diagram, the ORANGE striking group of 4 CAs and 7 CLs is seen to the northwestward leading up his DD line.

An hour later, considering Diagram 12 (Tact. Prob. V), with the wind 5 NE, sea moderate, the situation of the ORANGE cruisers driving through BLUE's cruisers with the 3 BBs only 10 miles distant as their objective, presents an interesting picture. Torpe-

does, guns, collision, star shell, cruisers, DLs and DDs at 28 knots. Had this hole been opened up, BLUE Batdivs II and V would have been attacked, and next the train. This raises the point of whether this massed attack carried through in a different formation might not have been successful and thereby wreck the BLUE formation. It emphasizes the necessity of BLUE battleships holding the attack off, once the cruiser-destroyer line is penetrated. The use of a battleship's main battery at night - with either star shell or searchlight control - is most difficult.

From 2347, 14 December (Diagram 13) until after 0300, 15 December (Diagram 24) the attack brought on almost a melee. The drive made by the ORANGE heavy CLs, 8 DLs and 20 DDs in the northwest battle area is one of the most spirited night tactical situations presented. The use of torpedoes and guns in this tight formation - following wind of force 5 and moderate sea, at high speed, presents many problems; and especially so as regards the use of curved fire ahead, 27-knot torpedo speed and the possible sympathetic explosion of torpedoes 200 yards from each other. This area might have been equally dangerous to BLUE and ORANGE. Considering our starshell experience, the difficulties of spotting gunfire at night, effect of blinding flash and short ranges, it would appear a tremendous problem to accurately control torpedoes or guns in this situation. Furthermore, the question of recognition of "friend" or "enemy" for targets in the rapidly moving picture is a serious one. Can it be done with our present Battle Force and Scouting Force? Added to the "Jutland picture", we have flares from aircraft (if such use is possible), star shell - and all 3,000 miles for both sides from repair bases (instead of 100 miles or less as at Jutland).

In a final consideration of this last period of this great "Night Action" - as under "Cruisers" - from 0130 to dawn, 15 December, (Diagrams 20 to 24 - Tact. Prob. V), we must remember that most of these vessels have been approaching or fighting for over four hours (and only 3 nights since a previous engagement). The BLUE CAs have been running short of ammunition and the sea too rough to make redistribution or transfer wounded to hospital ships. Even fueling at sea under such wind and sea conditions is questionable (Rules permit it).

In Diagram 21, the sinking of cruisers, destroyers and ARKANSAS makes the northern battle area a hard fought one - vessels before sinking firing torpedoes and submarines mixed up in the melee with cruisers and destroyers. And in the southern area - 5 to 10 miles distant, all cruisers gone, an ORANGE sub near the train, and a number of ORANGE DDs still pressing home the attack. The moon gone, the sea increasing, the few remaining BLUE AMs and DMs attempting to keep position - presumably darkened - and beyond to the southwest the train and 3 BB (Batdiv 4) which have thus far taken no part in the action. Yet, having seen all the illumination to the northeast in the final moments, BLUE began to lose vital parts - irreplaceable in her force - the repair ships MEDUSA and VESTAL, the HENDERSON with 1000 Marines, and with all these casualties, BLUE changed course by units and with no collisions.

As a result of these two night engagements plus the aircraft and submarine day attacks, some summaries of damage, torpedo hits and an interesting table of sources of damage to BLUE ships are given in the Summary by Commander Hoey (Enclosure O) and Captain Coffey (Enclosure M).

BLUE is at the end of the game - 3200 miles from Pearl Harbor and 1700 miles from Dumanquilas. ORANGE is 2600 miles from Pescadores and Sasebo. But ORANGE is nearer his "Mandate Bases". BLUE has 7 battleships damaged - 4 heavy cruisers and 1 light cruiser - to be sent home. He cannot possibly repair them. If

they continue on they hamper his movements and stand a good chance of being sunk. What can the BLUE C-in-C do with them in the face of a hurricane that is now on? ORANGE can get his damaged battle cruisers and carriers home if they can weather the hurricane.

If this night action had started sooner by ORANGE it is possible that the attrition would have resulted in even greater losses for BLUE.

(d) General Remarks on Problem.

(1) The various copies of important ORANGE communications appended show the importance of indoctrination, a flexible plan and the possible difficulties of broadcasting a new Operation Order to a scattered fleet - 3000 miles distant.

(2) The aggressive offensive of ORANGE (even though attended by a tremendous cruiser and destroyer loss) showed the possible chances of success against the BLUE circular formation - which was well handled and maneuvered according to the standard BLUE doctrine. From a tactical standpoint, it appears that even with BLUE at his best, ORANGE in his two night attacks might have driven his attacks home. And if the 1000# bomb hit is greater on a battleship than allowed, then BLUE's casualties would be even greater.

(3) It appears from this - and all other similar problems - that the BLUE cruising disposition - circular or rectangular - can be penetrated. The games and fleet experience seem to confirm this. And once weakened or smashed, it seems that the usual heavy losses by BLUE are bound to occur even though ORANGE suffers corresponding ones.

(4) The work of the submarines on both sides brought out of what importance they are to both BLUE and ORANGE. Day or night they get torpedo hits.

(5) The problem of night gunnery, torpedo control, smoke control, recognition signals, communications, personnel and use of aircraft are all emphasized in this problem. These subjects on a larger scale than fleet problems repeat past situations. Due to advances in aviation, torpedoes, communications, use of poison gas, mines and radio, controlled ships, etc., the picture is worse than at Jutland or the minor night engagements of cruisers and destroyers in the World War.

(6) The necessity for a tight screen with more cruisers, destroyers or sloops is demonstrated, for some cruising disposition would be used, even though on a smaller scale than our entire Navy. Seven years at the War College have brought out the same weaknesses to the front. In each problem, each year, there are "set-ups" to use as examples for BLUE planning, either "a steam roller"- "step by step advance" or "major raids" in a war with ORANGE. Furthermore, need of sloops for the screen, a reserve number of adequate, fast train vessels and underwater torpedo repair is indicated in this 1933 game, as in all other previous ones analyzed by the Research Department. Since 1927, with different size fleets, over different routes, with various assumptions, the same points of strategy, tactics, types, gunnery, weapons and effect upon personnel have arisen.

(7) This problem, based upon results of the game and the future ahead of the BLUE fleet in the Western Pacific, again shows the tremendous obstacles to be overcome - even with a Navy constructed up to Treaty Strength.

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