

U.S.S. BADOENG STRAIT (CVE-116)
c/o Fleet Post Office
San Francisco, California

CVE116/GRP/jhc
A12/10
Ser: 005 1511
5 Feb 1952

ORIGINAL

From: Commanding Officer and Commander Task Element 95.11
To: Chief of Naval Operations
Via: (1) Commander Task Group 95.1
(2) Commander Task Force NINETY-FIVE
(3) Commander SEVENTH Fleet
(4) Commander Naval Forces, Far East
(5) Commander in Chief, Pacific Fleet

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Subj: Action Report 17 December 1951 through 28 December 1951

Ref: (a) Article 0705 Navy Regulations
(b) OPNAV INST 3480.4
(c) CINCPACFLT INST 3480.1
(d) CTG 95.1 OpOrder 2-51 (Revised)
(e) CTE 95.11 OpOrder 2-51

Encl: (1) Sample Air Schedule
(2) Chart showing area of operations
(3) USS BADOENG STRAIT ltr serial 1341 of 20 November 1951

1. In accordance with references (a), (b), (c), and (d), the action report of Task Element 95.11 for the period 17 December 1951 through 28 December 1951 is submitted herewith. The Commanding Officer, USS BADOENG STRAIT (CVE-116) was CTE 95.11 during this period.

2. The report is divided into 6 parts, as listed below:

- | | |
|----------|--|
| Part I | General Narrative. |
| Part II | Chronological order of events. |
| Part III | Remarks on performance of ordnance material and equipment, including ammunition expenditure. |
| Part IV | Summary of own and enemy battle damage. |
| Part V | Personnel performance and casualties. |
| Part VI | Comments and recommendations. |

Part I - GENERAL NARRATIVE

(A) During the period 17 December 1951 through 28 December 1951, the USS BADOENG STRAIT (CVE-116) under the command of Captain Roy L. JOHNSON, 62606/1310, USN, and with Marine Aircraft Squadron VMF-212 embarked, Lieutenant Colonel Joseph A. GRAY, 06207/7302, USMC, Commanding Officer, operated as a

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part of the U.S. Seventh Fleet in Task Force 95, under the operational control of Commander Task Group 95.1.

(1) The Commanding Officer, USS BADOENG STRAIT, was Commander Task Element 95.11 from 2100 17 December to 2130 28 December 1951, at which time the Command of the Element was shifted to the Commanding Officer, HMAS SIDNEY (CVE-17). During the reporting period, TE 95.11 consisted of one escort carrier and a maximum of three destroyers acting as screening vessels. The screen was reduced to less than three ships when required by operational demands. The mission of this Task Element was to conduct air operations in support of the United Nations Blockade, West Coast of Korea, the United States Eighth Army in Korea (EUSAK), and to render search and rescue assistance as required.

(2) The enemy forces were the North Korean Peoples Army and "Volunteer" Chinese Communist Forces in enemy-held North Korea. No enemy surface or air forces were encountered by this Task Element and, therefore, no surface or air action is related. However, enemy small craft operating in the rivers, estuaries, and along the West Coast of Korea were attacked and destroyed by aircraft of this Task Element, when directed, or as targets of opportunity.

(3) During this operating period VMF-212 aircraft flew armed reconnaissance, Target Combat Air Patrol, Combat Air Patrol, pre-briefed Strikes, Airspot for Naval gunfire, and Photo Reconnaissance missions as illustrated by schedule in enclosure (1). Of the 11 days in the operating area only one entire day was lost to inclement weather, thus giving a total of 10 days of air operations. During this period VMF-212 flew 274 sorties of which 2 aborted. There was a total of 598.2 combat hours flown, for an overall average of 59.82 hours per day and 27.2 missions per day. The squadron aircraft allowance was 24, the total average aircraft flyable on board 23.1, and the total average aircraft availability 21.1.

(4) During this operating period ships of Task Element 95.11 operated in Korean Coastal areas, Nan and Mike, in the vicinity of Latitude 38-00N and Longitude 124-00E as a point OBOE. The screen consisted of the HMCS ATHABASKAN (D-29), HMS CHARITY (DDE-29), and the USS PORTERFIELD (DD-682). On 27 December 1951, the USS HANSON (DD-832) relieved the USS PORTERFIELD.

Part II - CHRONOLOGICAL ORDER OF EVENTS

- 170656/Dec - The BADOENG STRAIT got underway for the Yellow Sea area, with VMF-212 embarked, in company with HMCS ATHABASKAN in accordance with CTG 95.1 directive, from Sasebo, Japan.
- 171100/ Conducted AA gunnery firing drills (towed sleeve) enroute to the operating area.
- 172022 USS PORTERFIELD joined the screen, as previously directed. This ship had been operating with HMAS SIDNEY; "turn over" notes were passed by high-line.
- 172100 Relieved the HMAS SIDNEY (CVE-17) and assumed CTE 95.11.

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Part II - CHRONOLOGICAL ORDER OF EVENTS (Cont'd)

18 December - Refueled USS PORTERFIELD.

HMS CHARITY joined the screen, as previously directed. A total of 41 flights (14 of which were defensive) were flown this date. The weather was generally good. Major R. F. STUEBING, 020335/7302, USMCR, encountered ground fire while on an armed reconnaissance mission and his aircraft received a direct hit by a 20MM shell which exploded in the engine accessory section, causing a fire to break out. The pilot was able to get two miles out over TAEDONG INLET before bailout. He received minor cuts and burns and was rescued by a helicopter from the USS MANCHESTER (CL-82) patrolling that area.

VMF-212 aircraft accomplished the following:

<u>ORDNANCE EXPENDED</u>	<u>MISSIONS</u>
20 500 lb GP bombs	14 CAP
160 5" HVAR rockets	4 Armed Reconnaissance
26 3.5" rockets	4 Airspot
8 Napalm bombs	4 Strike
28,200 Rounds .50 cal. ammo	15 TarCap

19 December - HMCS ATHABASKAN and HMS CHARITY refueled from the BADOENG STRAIT.

191725/ HMS CHARITY detached to carry out night patrol assignment in the PAEGNYONG-DO area. The remainder of the force retiring southward for the night.

A total of 42 flights (10 of which were defensive) were flown this date. Weather was generally good.

VMF-212 aircraft accomplished the following:

<u>ORDNANCE EXPENDED</u>	<u>MISSIONS</u>
25 500 lb. GP bombs	10 CAP
224 5" HVAR rockets	11 Armed Reconnaissance
6 Napalm bombs	1 Photo
30,000 Rounds .50 cal. ammo	20 TarCap

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- 191752/ Weather reconnaissance plane from VP-SIX, based in Japan, reported sighting 30 un-identified trawlers at Latitude 36-20N, Longitude 123-00E.
- Commander Task Force 95 directed CTE 95.11 to investigate.
- 192017/ HMCS ATHABASKAN and USS PORTERFIELD detached from the screen to conduct search for reported trawlers.
- 20 December - HMCS ATHABASKAN and USS PORTERFIELD rejoined formation at first light. Results of search negative.
- CTE 95.11 was directed to furnish CAP for coastal convoy enroute to INCHON.
- Refueled USS PORTERFIELD and HMCS ATHABASKAN.
- 201648/ USS PORTERFIELD detached to carry out night patrol assigned in the PAEGNYONG-DO area. The remainder of the force retiring southward for the night.
- A total of 39 flights (18 of which were defensive) were flown this date. Weather in general was good.

VMF-212 aircraft accomplished the following:

<u>ORDNANCE EXPENDED</u>	<u>MISSIONS</u>
11 500 lb. GP bombs	18 CAP
145 5" HVAR rockets	21 TarCap
10 Napalm bombs	
17,700 Rounds .50 cal. ammo	

- 21 December - USS MANCHESTER, with USS EVERSOLE as escort, joined with TE 95.11 at Latitude 38-25N and Longitude 124-10E.
- CTE 95.11 conferred with Rear Admiral DYER, CTF-95, aboard the USS MANCHESTER.
- Major R. F. STUEBING, USMCR was returned from the USS MANCHESTER via helicopter.
- 211653/ USS MANCHESTER and USS EVERSOLE departed.
- 211658/ HMCS ATHABASKAN was detached to night patrol assignment in the PAEGNYONG-DO area.
- Only 2 flights (these being CAP) were flown this date. Weather remained foggy all day.

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22 December - Refueled HMCS ATHABASKAN, and CHS CHARITY.

A total of 12 flights (2 of which were defensive) were flown this date. Weather remained foggy until early afternoon.

VMF-212 aircraft accomplished the following:

<u>ORDNANCE EXPENDED</u>	<u>MISSIONS</u>
8 500 lb. GP bombs	2 CAP
92 5" HVAR rockets	4 Armed Reconnaissance
4 Napalm bombs	2 Airspot
6,700 Rounds of .50 cal. ammo	4 TarCap

23 December - Refueled USS PORTERFIELD

A total of 35 flights (10 of which were defensive) were flown this date. Weather was excellent.

231701/ Detached USS PORTERFIELD to carry out night patrol assignment in the PAEGNYONG-DO area.

VMF-212 aircraft accomplished the following:

<u>ORDNANCE EXPENDED</u>	<u>MISSIONS</u>
24 500 lb. GP bombs	10 CAP
191 5" HVAR rockets	6 Armed Reconnaissance
24,000 Rounds of .50 cal. ammo	19 TarCap

24 December - Refueled HMCS ATHABASKAN.

A total of 42 flights (10 of which were defensive) were flown this date. Weather was excellent.

241710/ HMCS ATHABASKAN detached to carry out night patrol assignment in the PAEGNYONG-DO area.

VMF-212 aircraft accomplished the following:

<u>ORDNANCE EXPENDED</u>	<u>MISSIONS</u>
8 1000 lb. GP bombs	10 CAP
20 500 lb. GP bombs	12 Armed Reconnaissance
191 5" HVAR rockets.	20 TarCap

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ORDNANCE EXPENDED

MISSIONS

61 3.5" rockets

4 Napalm bombs

38,500 Rounds of .50 cal. ammo

25 December - HMS CHARITY detached to night patrol assignment in the PAEGNYONG-DO area.

No flight operations conducted due to rain and fog that continued all day. A Merry Christmas was had by all.

26 December - Refueled USS PORTERFIELD and HMS CHARITY.

USS PORTERFIELD detached to proceed on night patrol assignment in the PAEGNYONG-DO area.

Only 10 flights (2 of which were defensive) were flown, due to inclement weather.

VMF-212 aircraft accomplished the following:

ORDNANCE EXPENDED

MISSIONS

8 1000 lb. GP bombs

10 CAP

19 500 lb. GP bombs

8 Armed Reconnaissance

159 5" HVAR rockets

8 Strikes

94 3.5" rockets

15 TarCap

4 Napalm bombs

38,000 Rounds of .50 cal. ammo

271706/ HMCS ATHABASKAN departed to night patrol assignment in the PAEGNYONG-DO area.

28 December - USS HANSON temporarily detached to join TU 90.82.7 as convoy screening ship and CAP control. However, due to reduced visibility in the convoy area, CAP was not launched. The HANSON returned to TE 95.11 about 1230.

USS HANSON and HMCS ATHABASKAN refueled during the day.

281650/ USS HANSON detached to carry out night patrol assignment in the PAEGNYONG-DO area and directed to join the HMCS SIDNEY who assumed GTE 95.11 on 29 December 1951. The USS HANSON also carried the "TURNOVER" notes that were to be passed

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to HMAS SIDNEY. The BADOENG STRAIT with HMCS ATHABASKAN and HMS CHARITY in company, and VMF-212 embarked, took departure from the operating area for Sasebo, Japan.

281922/ HMCS ATHABASKAN detached to proceed to the port of Kure, Japan independently.

282130/ The Commanding Officer, HMAS SIDNEY, assumed command of Task Element 95.11 in area MIKE. The BADOENG STRAIT continued course for Sasebo, Japan in company with HMS CHARITY.

Inclement weather curtailed flight operations this date. 8 flights (all of which were combat) were flown.

VMF-212 aircraft accomplished the following:

<u>ORDNANCE EXPENDED</u>	<u>MISSIONS</u>
8 500 lb. GP bombs	4 Armed Reconnaissance
62 5" HVAR rockets	4 Strike
4,800 Rounds of .50 cal. ammo	

Conducted AA gunnery firing drills (towed sleeve) enroute to Fleet Activities, Sasebo.

29 December - HMS CHARITY detached to proceed independently to Kobe, Japan.

291723/ Moored at buoy #18, Sasebo harbor, to remain through 6 January 1952 for replenishment and recreation.

Part III - PERFORMANCE OF ORDNANCE MATERIAL AND EQUIPMENT INCLUDING AMMUNITION EXPENDITURE

A. The gasoline heating unit for mixing NAPALM, as described in enclosure (3), was evaluated operationally during this period. The results proved extremely satisfactory and a separate report is under preparation pointing out the capabilities and applicability of the equipment as designed.

B. The assembly, arming, and stowage of Mk 77 Mod 0 Fire Bombs presented several problems. Assembly was time consuming due to the care that must be exercised in tightening the tie-rod nut to the prescribed 425 in/lbs. torque. Of the 36 bombs used, tie-rod threads were stripped on 4, making the entire bomb useless in all four cases. An additional three bombs separated while planes were being catapulted. This was believed to be caused by the stripping of the tie-rod threads also.

C. The disengaging of hung-rockets during arrested landing created an awkward situation. The most efficient method involved, to prevent damage to the ship or other aircraft by these rockets traveling down the flight deck was the innovation and use of the "Fredericks Barrier". This consisted of lashing

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six cargo nets together - forming two sections of three nets each. These two sections were strung across the flight deck just aft of the forward elevator to serve as a deck-level barrier in which wandering rockets were caught and then jettisoned. After landing an aircraft with hung-rockets the nets were pulled apart, gate fashion, to allowing taxing forward. Ten plane handlers were required to open and close the nets. A total of 74 hung-rockets were returned to the ship during this operational period.

D. The fire-power umbrella of this ship does not extend the full 360 degrees around the ship. There exists a vacant 20 degree sector on the bow, 10 degrees on either side. This was caused by the authorized removal of the forward 40MM mount.

E. The fire control system is not completely adequate for night radar firing as the computer system installation has no direct method of designation of air targets from CIC to the Gun Control Platform.

F. Facilities are not available for developing gun camera film aboard the CVE-105 type carrier. Damage assessment is consequently a matter of memory or personal evaluation at de-briefings.

G. The ASW allowance of Mk 24 mines, that is required to be carried, consumes valuable storage space that could otherwise be used to advantage to store armament more in line with the mission of the ship during this type operation.

H. Ammunition expenditures:

1. During the operating period covered by this report the following ordnance was expended.

BY VMF-212 AIRCRAFT

1000 lb. GP bombs	19
500 lb. GP bombs	140
5" HVAR rockets	1,266
3.5" rockets	181
Napalm (Fire Bombs)	36
6.5" ATAR rockets	24
.50 Cal. (Belted)	195,400

BY USS BADOENG STRAIT

40MM	4,472
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Part IV - SUMMARY OF OWN AND ENEMY BATTLE DAMAGE

A. Own battle damage -

1. None of the ships of the task element sustained battle damage.
2. For damage sustained by aircraft see Naval Air Warfare reports (OpNav 338.5 Revised 4-51) submitted for this operating period.

B. Battle damage inflicted on the enemy -

1. Ships of this task element inflicted no damage on the enemy while operating as part of the screen during the period covered by this report.
2. For battle damage inflicted on the enemy by aircraft of the task element see Naval Air Warfare reports (OpNav 338.3 Revised 3-51) submitted for this operating period.

Part V - PERSONNEL PERFORMANCE AND CASUALTIES

A. Personnel performance was considered to be excellent and in the general high standard of the Navy and Marine Corps.

B. Casualties -

1. On 18 December 1951, Major R. F. STUEBING, USMCR, was forced to bail out over water after his aircraft was hit by enemy ground fire from enemy held territory in North Korea. He was recovered by helicopter. He suffered minor burns and lacerations on the face.

C. The recommended wartime complement as submitted by this command to COMAIRFAC on 10 October 1951, reflects CVE-105 personnel requirements for this type operation. Comments from individual departments are as listed below:

1. Executive Department: Requires 1 additional YNT2, as legal yeoman; 1 typewriter repairman.
2. Air Department: Total numbers adequate. Recommend dropping 1 ADC, 3 AD1, 4 AD2, and 6 AD3, totaling 14 men, to be replaced by 7 AN's and 7 AA's.
3. Dental Department: Recommend the allowance of dental officers on CVE's be increased to 2.
4. Navigation: Adequate.
5. Supply Department: Inadequate. Additions required are 1 DK1, and 5 non-rated men.
6. Gunnery Department: Recommend 12 more non-rated men in order to more efficiently maintain Condition THREE watches.

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7. Operations Department:

a. Under the present method of having Quartermasters and Signalmen considered as one rating, it is recommended that the present allowance of 17 QM's be increased to 20 ratings to include 12 ratings with Signalmen qualifications (NJC 0230-0239), in order that continuous around the clock watches may be stood.

b. That the photographer allowance be increased by 3, to total 6 (1 PH3, and 2 AN(PH) additional).

c. Increase of three RD3 and three radarman strikers.

Part VI - SPECIAL COMMENTS ON DOCTRINE AND OPERATIONAL PROCEDURES

A. The operation of the BADOENG STRAIT and VMF-212 as part of TE 95.11, in conjunction with other surface units, was considered to have been most effective in the enforcement of a seaward and coastwise blockade of the West Coast of Red held Korea between latitudes 37-30N and 38-50N. The tactical advantage afforded by CTE 95.11 closing to within 33 miles of the enemy coastal area for daily launchings made it possible to schedule two hour missions, each composed of from six to eight aircraft, continuously during daylight hours. A veritable shuttle on "demand" targets was conducted in the face of the continual threat of "hit-and-run" attacks by Manchurian based Red air forces.

B. The employment of VMF-212 fighter-bomber F4U-4 aircraft as CAP for troop convoys proceeding along the West coast of Korea detracted to a great degree from the primary mission of TE 95.11. Fully realizing the need for this CAP, it is believed, however, that carrier planes of this type could be more profitably employed wherein their armament carrying capabilities were exploited against the enemy.

C. At the present time CIC has no satisfactory means of positively identifying friendly aircraft. In the event the enemy elected to launch token or all-out air attacks against TE 95.11, the situation would become quite critical with the enemy in an excellent position to strike the first blow and thus temporarily take command of the situation.

D. The maximum number of screen ships available during daylight hours was three. At darkness, and until dawn, the size of the screen was automatically reduced to two ships, as the third was diverted to night patrol around islands lying off the Red held coastline. A definite submarine threat would pose a very difficult problem with such an inadequate ASW screen.

E. LESSONS LEARNED -

1. Weather prognostications were so difficult as to try the patience of the best, because reports from the westward were simply non-existent.

RECOMMENDATION: Employ aerologists with experience in the Yellow Sea area. Equip carriers operating in the Yellow Sea area with Rayinsonde and Facsimile Transceivers.

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2. Intelligence data of all types is continually pouring in, requiring accurate interpretation and evaluation at all hours of the day and night.

RECOMMENDATION: A minimum of two officers and six enlisted personnel who are graduates of advanced schools of Combat Intelligence should be made available to carrier task element commanders.

3. Panoramic photo intelligence was not available upon deployment and was a great hindrance in the debriefing analysis. After every fresh snow fall the features of the target areas would take on new profiles. Present AMS (1:50,000) charts, though accurate and detailed, became as confusing as adolescent finger-paintings.

RECOMMENDATION: That photo aircraft and pilots be assigned to each carrier. A detachment of two of the type planes employed by the squadron embarked would suffice on a CVE carrier.

4. A lack of pre-deployment training in close-air support and target interdiction work, where available shipboard intelligence plays a major part, created a temporary difficulty in understanding many problems of the embarked squadron.

RECOMMENDATION: Coordinate training with Marine Squadrons based at El Toro prior to deployment to the Far East area. The practice of the relieving carrier, arriving from CONUS, sending key personnel on the last period of operations to embark on the carrier in TF-95 is considered an extremely sound and essential practice.

5. The projection of enemy air and submarine attacks against this small task element would very radically alter the present, almost complete freedom of action enjoyed.

RECOMMENDATION: That additional escort vessels for air defense and ASW be assigned insofar as practicable in order that the current freedom of action would not be curtailed in the event of overt attacks.

Royal E. Johnson
ROYAL E. JOHNSON

Copy to: (ADVANCE)

CNO	CGairFMFPac
ComMarCorps	CGFMFPac
CINCPACFLT	CGLstMAW
COMNAVF	USS BAIROKO (CVE-115)
COM7thFLT	USS BATAAN (CVL-29)
CTF-95	USS SIGILY (CVE-118)
CTG-95.1	USS RENDOVA (CVE-114)
COMAIRPAC	CO MAG-12
COMCARDIV 17	CO VMF-212



AUTHENTICATED:

G. R. PALUS
Commander, U.S. Navy

U.S.S. BADOENG STRAIT (CVE-116)
c/o Fleet Post Office
San Francisco, California

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27 January 1952

SUNRISE 0749

FLIGHT SCHEDULE FOR
27 January 1952

SUNSET 1805

<u>Event</u>	<u>Comp.</u>	<u>Mission</u>	<u>Launch</u>	<u>Land</u>	<u>Ammo.</u>	<u>Fuel</u>
A-1	2	CAP	0730	0925	Note 1	380 gals.
A-2	2	TARGAP	0730	0925	Note 3	" "
A-3	6	STRIKE	0730	0925	Note 4	" "
B-4	2	CAP	0910	1100	Note 1	" "
B-5	2	TARGAP	0910	1100	Note 3	" "
B-6	4	RIVER RECCO	0910	1100	Note 3	" "
C-7	2	CAP	1045	1235	Note 1	" "
C-8	2	TARGAP	1045	1235	Note 3	" "
C-9	4	STRIKE	1045	1235	Note 5	" "
D-10	2	CAP	1220	1415	Note 1	" "
D-11	2	TARGAP	1220	1415	Note 3	" "
D-12	4	STRIKE	1220	1415	Note 6	" "
E-13	2	CAP	1400	1550	Note 1	" "
E-14	2	TARGAP	1400	1550	Note 3	" "
E-15	4	COAST RECCO	1400	1550	Note 3	" "
F-16	2	CAP	1535	1730	Note 1	" "
F-17	2	TARGAP	1535	1730	Note 3	" "
F-18	4	STRIKE	1535	1730	Note 5	" "

NOTES:

1. All A/C full load .50 Cal.
2. Maintain 2 A/C on Condition 11 after each launch from one-half hour before sunrise until sunset.
3. 500# 4/5 delay, 8-HVAR
4. 4 A/C with 1000# GP/DC, 8-HVAR
2 A/C NAPALM, 8-HVAR
5. 2 A/C - 500# GP/DC, 8-WP
2 A/C - NAPALM, 8-WP
6. 500# GP/DC, 8-HVAR

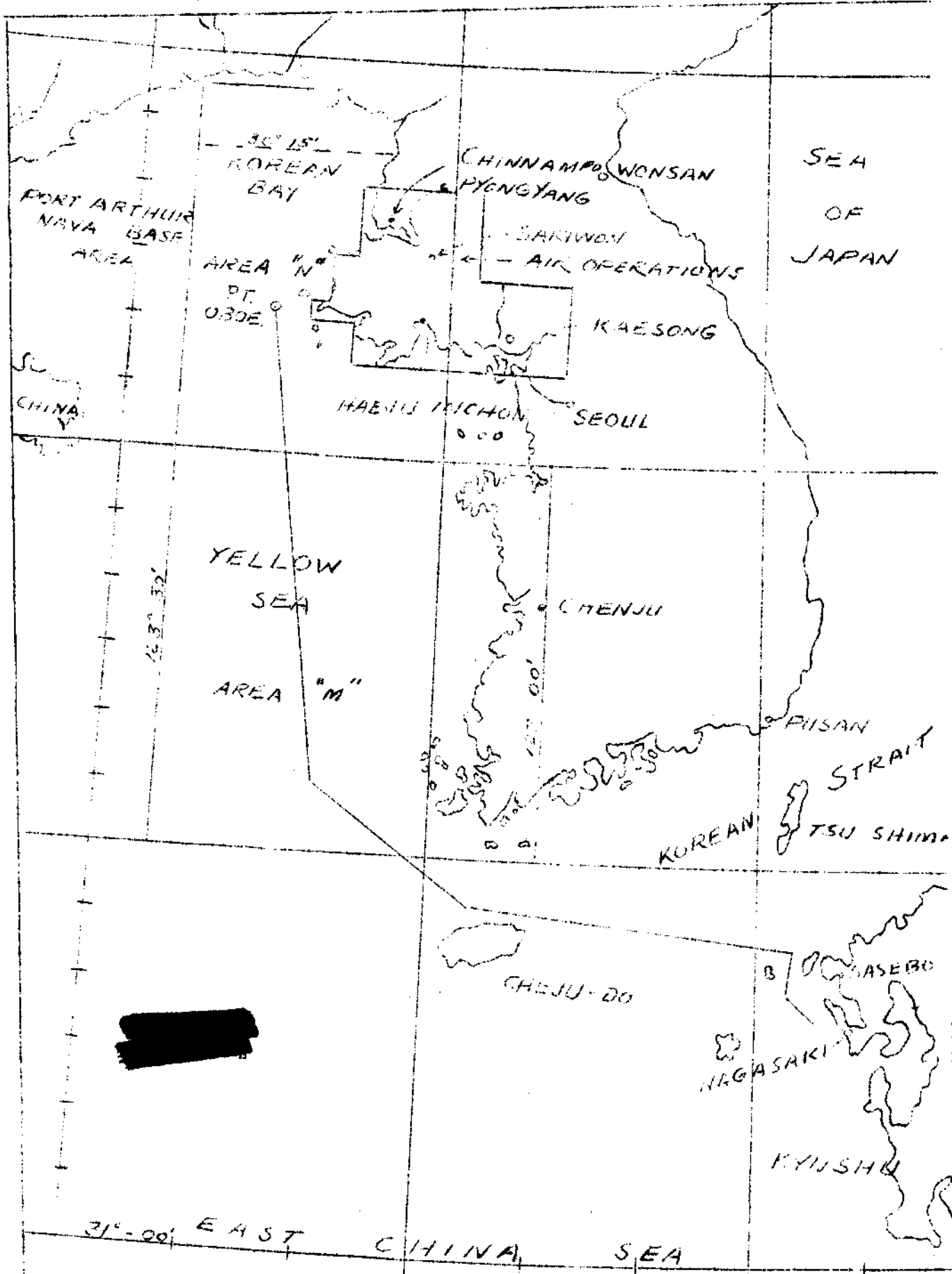
Approved:

G. R. PALUS
CDR, USN
Operation Officer

Submitted:

A. S. IRISH
LCDR, USN
Air Oper. Officer

Enclosure (1) to USS BADOENG STRAIT ltr Serial 005 of _____



20 NOV 1951


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From: Commanding Officer, U.S.S. BADOENG STRAIT (CVE-116)
To: Commander Air Force, Pacific Fleet
Via: Commander Carrier Division SEVENTEEN


Subj: Mixing of Napalm in Cold Weather

Ref: (a) COMAIRPAC ltr serial 30/14896 of 30 August 1951

Encl: (1) Photograph of Strainer Shell
(2) Photograph of 5/8" Copper Tubing (Coiled)(three prints)
(3) Photograph of Baffle Plate welded to coils
(4) Photograph of Header (two prints)
(5) Photograph of Temperature Gauge (Well type)(two prints)

1. It is the purpose of this letter to describe, in response to reference (a), a napalm heater unit developed by this ship.
2. The basic idea of the heater, as developed, is that the gasoline is heated by steam directly rather than by means of water. The heating system is prepared in a reamed out strainer shell as pictured in enclosure (1). The two coils of 5/8" copper tubing total 90 feet in length, 50 feet in the larger coil and 40 feet in the smaller coil as pictured in enclosure (2). A baffle plate is welded in the center of the coils causing the flow of gasoline to circulate properly throughout the length of the unit to give the desired increase in temperature for heating of the gasoline as pictured in enclosure (3). The header with a baffle plate is used to control the flow of steam from the inlet to the discharge point as pictured in enclosure (4). Enclosure (5) pictures the unit installed, and the location of the well type temperature gauge and hand valve to control the steam entering the unit. This unit uses a steam pressure of 35 pounds in the copper coils with 65 pounds of gasoline pressure from the pump room. The increase of gasoline temperature under test was 45° with 35 pounds at the mixing hopper which is believed to be sufficient for mixing of napalm under most adverse weather conditions.
3. It is believed that the heater described has the following advantages:
 - a. Greater safety. Complete drainback is accomplished. Any leaks will introduce steam (water) into the gasoline which does no harm.
 - b. Greater accessibility. Units can be easily installed at any fueling station desired, either flight or hangar deck. This permits napalm tanks to be invariably filled on the planes and eliminates the handling of filled tanks.

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c. Greater convenience. No bulky equipment in the way. No water splashing about on deck.

d. Greater speed. A minimum of equipment to handle. The number of heating units can be increased to permit mixing napalm in a minimum length of time.

J. C. ALDERMAN