

**30 AUGUST 1990**

**TWENTY-FOURTH DOD EXPLOSIVES  
SAFETY SEMINAR**

**SESSION: SITE PLAN AND SURVEY**

**TITLE OF PRESENTATION  
HEADQUARTERS, DEPARTMENT OF ARMY  
WORLDWIDE PORT STUDY**

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## PRESENTATION

### Slide #1

Good afternoon, I'm Gary Abrisz, the Chief of the Logistics Explosives Safety Division at the U.S. Army Technical Center for Explosives Safety, located in Savanna, Illinois.

The U.S. Army's Director of the Army Staff has directed a Worldwide Survey of commercial seaports being used to handle Department of Defense munitions. The U.S. Army Technical Center for Explosives Safety is the lead agency for the Army. We, of course, require direct participation by the Department of the Army Deputy Chief of Staff for Logistics and the Military Traffic Management Command, as well as many other organizations throughout the Department of Defense and the U.S. Coast Guard.

### Slide #2

This is the outline of my presentation. I'll define the purpose, discuss briefly the historical concerns, and provide an overview of our established action plan. We have been involved in several onsite surveys including the download of ammunition from prepositioned ships afloat (which I'll refer to as PREPO throughout this presentation). This was in the Pacific area for the required maintenance cycle. I'll discuss that involvement.

### Slide #3

The use of commercial seaports, as well as military ports, worldwide for movement of Department of Defense munitions raises many concerns due to the exposures to people and property in the port areas. In many instances, as you'll see, the populations are directly adjacent to operations involving millions of pounds of high explosives ammunition.

### Slide #4

Historically, our largest and most destructive explosives accidents have occurred in port areas. Most everyone has heard of the 1917 Halifax Harbor, Nova Scotia, accident shown here.

The Port Chicago, California, disaster in 1944 involved ammunition ships supplying the Pacific theater and is the accident principally responsible for our present day Department of Defense standards concerning separation requirements for piers and wharves. In many ways we do things differently now with the advent of modern ships, improved handling procedures, and packaging, but the potential and concerns do remain.

### Slide #5

The Army leadership recognized, based on various Army commands requesting exemptions to the Department of Defense standards and the many DDESB surveys, that we currently do not know the full extent of our capabilities to handle ammunition at ports around the world in compliance with the explosives safety standards. The extent of violations and exposures must be defined and then result in plans being developed for violation resolution.

Slide #6

In November 1988, the Director of the Army Staff directed the Port Study. The Deputy Chief of Staff for Logistics action was related to the Assistant Secretary of the Army (Installations, Logistics, and Environment) approval of an exemption for the Port of Nordenham, Germany. This was to operate in violation of the Department of Defense standards. Alternatives to Nordenham were to be pursued.

Slide #7

To accomplish the Director of Army Staff directive, a working group was established and has proceeded to accomplish the study. In March 1989, Lieutenant General Kicklighter, then the Director of Army Staff, was provided a briefing on the methodology and plan. He approved the proposed action plan. Working in parallel with this study of peacetime port capabilities, the Army Deputy Chief of Staff for Logistics was directed to identify wartime contingency port capabilities.

Slide #8

This slide shows the list of commercial ports that the Military Traffic Management Command has identified as being used for peacetime movements of ammunition over the past five years. Those with check marks we have either visited or have detailed exemption request information on. This list continues to be refined and enlarged.

Slide #9

In addition to the commercial ports, we have been directed to do special studies of the military facilities shown here. This, except for Chinhae, is in relationship to PREPO activities, which I'll discuss in more detail as we proceed.

Slide #10

This slide and the following slide show our action plan and the milestones established. We have had several onsite visits and two in-process-review meetings to adjust and revise the plan as necessary. It could, and probably will, change again.

Slide #11

We are currently in the process of collecting site-specific information concerning tonnages, frequency of use, vessels used, the vessels' load configurations, port area property, and population statistics. As I stated previously, we must define capabilities and exposures and then have plans to resolve the problem areas.

Using the information gathered, a technical assessment of each port is conducted. This identifies port capabilities, the net explosive weights being introduced, and the resulting exposures. Once defined, we will be looking at feasible alternatives to control the maximum credible event or, possibly, mitigate the effects of an explosion within a ship or at the immediate area dockside. This approach was accomplished by a special interservice working group for the Port of Hachinohe, Japan, and I'll discuss that action in more detail in a few moments.

Slide #12

First, I'll run through specific onsite surveys to give you a clear perception of the broad scope of our problems. We have exposures and situations at our military terminals in the U.S. which we address using military waivers and exemptions.

Slide #13

The Port of Valdez, Alaska, shown here, is a commercial port and the only one having an approved DDESB site plan. It is limited to the small quantity of 190,000 pounds net explosive weight. It is used by the Army's Western Command to service installations in Alaska.

Slide #14

Even our Military Ocean Terminal at Sunny Point does not meet all requirements. The main ship channel is at less than the required distance and contingency loading of the wharves would result in exposures across the Cape Fear River.

Slide #15

This is an aerial view of the three 2,000-foot wharves at Military Ocean Terminal, Sunny Point, south to north, each with a peacetime limit of six million pounds net explosive weight.

Slide #16

This slide shows, in orange, the expansion across the Cape Fear River of the quantity distance zone when the loads go up to the 19 million pounds range during contingency. An Army exemption is under review at Military Traffic Management Command and Headquarters, Department of the Army to address these exposures.

Slide #17

I mentioned earlier the Army exemption for Nordenham Port, Germany.

Slide #18

Nordenham is currently the only port used to move ammunition in and out of north central Europe. It operates under an Assistant Secretary of the Army (Installations, Logistics, and Environment) 1988 exemption. This is due to the close proximity of the Village of Nordenham and 30,000 inhabitants.

Slide #19

You can see the village in this slide. Ammunition is downloaded onto railcars and moved down-country. The use of MILVANS and ISO containers expedites the process and reduces the exposure time. The original Director of the Army Staff directive and the exemption approval relates to the Army Deputy Chief of Staff for Logistics and U.S. Army, Europe continuing to pursue alternative ports.

Slide #20

Ports, such as Eemshaven in the Netherlands, have accommodated past test shipments of ammunition into Europe and have limited exposures. We visited this port in April 1989.

Slide #21

This is a picture of the ship-berthing area at Eemshaven.

Slide #22

We have visited Central America where, in Panama, the Army uses Mindi Pier on the Panama Canal.

Slide #23

Exposures result to ship traffic, as well as the canal railroad. The pier is operated under waiver due to the limited capability.

Slide #24

This picture shows the close proximity of the shipping to the pier area. Alternatives to Mindi Pier are being reviewed and, in the interim, U.S. Army South is considering an exemption request.

Slide #25

We have traveled to Japan on several occasions to survey ports there. I'll first discuss Hachinohe Port, which I mentioned earlier received a special interservice working group evaluation based on a DDESB survey in 1987.

Slide #26

Hachinohe Port is in northern Japan and has only a capability from an explosives safety standpoint, due to exposures to the surrounding area, of handling 40,000 pounds net explosive weight. The DDESB survey in 1987 resulted in an effort to define a plan to handle three shiploads of mark 80 series high explosive bombs, cluster bomb units, and 20mm in the safest manner possible. The S.S. Dawn was to be used for all three shipments from Okinawa to Japan. An Interservice (Army, Navy and Air Force) working group prepared a specific pre-stow and port discharge plan to be used. Military Traffic Management Command engineers and stowage planners assisted explosives effects researchers and explosives safety specialists in the preparation.

Slide #27

The result was a stowage plan for the S.S. Dawn, as shown on this slide. Using the test data from the U.S. Air Force buffered storage tests for Mark 80 Series bombs, the group provided a technical concept that, in the opinion of the group, should provide for a reduction in and the control of the maximum credible event should a detonation occur onboard the vessel or at dockside. Of course, strict implementation of the plan was required to assure maximum credible event control could be realized.

Slide #28

The buffered configuration was considered to relate to a maximum credible event of 80,000 pounds net explosive weight (considering the worst case of 40,000 pounds bomb stack and 40,000 pounds cluster bomb units). This slide depicts, in yellow, the quantity distance zone reduction relative to the orange 890,000 pounds zone. This plan was used for the three ships. It is an approach we'll be looking at in other areas based on our study findings. One must, however, remember it was specific to one ship, a limited number of munition items, and testing of bombs.

Slide #29

I mentioned earlier we were tasked to review military facilities used to download and handle ammunition from the Army's PREPO during maintenance cycles. Specifically, Hiro and Akizuki, Japan, facilities. Hiro and Akizuki facilities are geographically located approximately 450 miles southwest of Tokyo, Japan, near the city of Hiroshima. The facilities are the responsibility of 83d Ordnance Battalion, headquartered at Kure, Japan. We are dealing with net explosive weights (worst case) of close to 10 million pounds onboard one vessel. The concern, of course, is doing it safely with the least possible exposures.

Slides #30 & 31

These slides show the ship with individual barges both below and above deck. The ships have tugs onboard which are lower and used to move the barges from the ship to shore. (Slide) In the past, operations were conducted at Subic Bay, Philippines, and resulted in minimal exposures. Political realities in that part of the world have resulted in the Army looking for alternative locations. (Slide) The first operations outside Subic were conducted in Japan and resulted in much greater exposures raising concerns by the DDESB and requiring thorough evaluations by the Army.

In March 1989, a Headquarters, Department of the Army Task Force Team was organized and directed by the Director of the Army Staff to make PREPO operations a priority in the worldwide ammunition port study. In part, to review the U.S. Army, Japan, request for an Assistant Secretary of the Army (Installations, Logistics, and Environment) letter of certification to allow construction at Hiro facility, Japan, in violation of the Department of Defense explosives safety standards.

Slide #32

This is an aerial view of Hiro facility in red.

Slide #33

Hiro was developed during World War II as a Japanese underground manufacturing and test complex for seaplane engines. The configuration currently used by U.S. Army, Japan for ammunition operations at Hiro includes two concrete piers, large hardstand areas, and three caves. Included also at Hiro is a surveillance workshop and inert warehouses. Hiro is surrounded by villages totaling in population of approximately 25,000. In addition, the Toyo pulp plant is located in close proximity and operates with 450 employees. From an explosives safety standpoint, there is no capability to handle 1.1 munitions at Hiro facility. It operates under major Army command waiver.

Slides #34, 35, & 36

This is a view overlooking the main cave, used for storage, and the hardstand, which is directly in front and which was used to lay down PREPO ammunition. The pulp plant and other industries are directly across the water. (Slides 35 & 36) These slides show the front of the cave and inside the cave complex.

Slide #37

This is an aerial view of the Akizuki Depot Complex in red. Akizuki Depot was a World War II Japanese Naval ammunition storage area designed to store torpedoes. Akizuki Depot is on the small island of Eta Jima, with population concentrations on each end of the installation. At the north, or top, of the red area is Koyo, a village of 2,481 people. At the south end is Akizuki, a village of 916 people. The configuration for storage includes 19 caves, 14 aboveground magazines, 3 inert warehouses, 2 open storage sites, 2 barge loading piers (3 and 4), and a wharf at each end of the area capable of barge handling. The caves vary in size, but basically average 200 feet in length, 40 feet in width, with chamber height varying from 20 to 25 feet.

Slide #38

Under normal U.S. Army, Japan operations, no Department of Defense Hazard Class/Division 1.1 ammunition is stored at Akizuki Depot. Based on the U.S. Army, Japan operational requirements, a comprehensive plan was defined by the Army task force to prescribe the safest conduct of PREPO operations consistent with mission requirements. Serious violations remained.

Slide #39

The search for alternative locations for PREPO continues. At the request of the Commanding General of the Army's Western Command in January of this year, the Headquarters, Department of the Army Worldwide Ammunition Port Study Team visited Tengan Pier; White Beach, Okinawa; Fleet Activity, Sasebo, Japan; and Apra Harbor in Guam. This was accomplished and a report prepared. I'll briefly discuss each location surveyed.



Slide #40

Okinawa is an island prefecture of the nation of Japan, located in the Ryukyu group, approximately 1,000 miles south of Tokyo. It is densely populated with over one million inhabitants residing primarily in its south and central regions. The island comprises approximately 454 square miles. The U.S. installations of all services occupy more than 20 percent of the island's area.

Tengan Pier, shown on this slide, operated by the Fleet Activity, Okinawa, is located on Kin Bay on the east side of the island. It is the primary ammunition pier for the island and routinely services U.S. Navy combatant and supply ships, as well as commercial breakbulk vessels. It is not now equipped to accommodate lighters, however Military Traffic Management Command, Okinawa, is interested in acquiring a fendering system which would allow use by barges/lighters. It operates under a Chief of Naval Operations waiver for 2.25 million pounds net explosive weight and event waivers for larger loads. It can handle around 70,000 pounds net explosive weight while meeting Department of Defense standards. The study team concluded that Tengan Pier, in combination with Kadena Munitions Storage Area, provides a potential for PREPO ammunition ship download with minimal exposures to property and people. The location has the potential to meet the Department of Defense/Army ammunition and explosives safety standards in all aspects except pier operations, which could be limited and controlled by operational considerations.

Slide #41

White Beach Naval Facility, located on Buckner Bay south of Tengan Pier and 10 miles from Kadena Ammunition Storage Area, consists of 2 piers. One, the U.S. Navy pier, is sited for 25,000 pounds net explosive weight. The other, the Army pier rebuilt in 1989, is designated as a petroleum, oils, and lubricants storage area. This and the congested traffic situation between the pier and the laydown area at Kadena Ammunition Storage Area precludes consideration of White Beach as a site for PREPO. The Navy indicated they could not accept an ammunition ship at White Beach. All such activities are sent to Tengan Pier.

Slide #42

Sasebo was visited also. It is operated by the Commander, Fleet Activities, Japan. It offers a definite laydown capability for PREPO. The ship anchorage operates under Chief of Naval Operations waiver. Using a well-defined operational plan, the anchorage could be the only area at Sasebo that a PREPO operation would create exposures beyond the maximum allowed by the Department of Defense/Army ammunition and explosives safety standards. Exposure would be limited to the time the ship is downloading and uploading barges. The Navy provides event waivers for such violations and has handled ships with heavier loads than Army PREPO. Beyond the ship anchorage, explosives safety considerations could be met in most all aspects of the operation.

Slide #43

Hario-Shima Ordnance Facility offers very calm waters in the adjacent bay with an area large enough to accommodate the necessary barge holding areas.

Slide #44

The Ordnance Facility operates under Chief of Naval Operations waiver due to the 1.2 million pounds net explosive weight required for Navy operations at this wharf. The PREPO barge operational requirements could limit this to much less net explosive weight and meet the explosives safety requirements. The potential for ammunition laydown in the Hario-Shima Ordnance Facility would exceed a total PREPO ship laydown and still meet the intent of the Department of Defense/Army ammunition and explosives safety standards.

Slide #45

The next area to discuss is Guam. The island of Guam is a U.S. territory located at the southern tip of the Marianas chain. It is approximately 212 square miles in size. It is the site of the westernmost ammunition supply point on U.S. soil lying 1,200 miles east of Manila and 1,250 miles southeast of Okinawa. The island receives nearly all of its commercial goods through this Apra Harbor that you see here via container ships. These arrive on the average of once per day. Other routine ship traffic in the harbor consists of fishing craft and those bring the ship count to approximately nine per day. Guam is a viable alternative for PREPO ammunition operations. There would be violations to the Department of Defense/Army ammunition and explosives safety standards when a ship entered the Apra Harbor and when barges are anchored in the harbor area. Looking north, shown here, is a Navy maritime prepositioned ship anchored. The Army PREPO vessels, upon anchoring there, would expose in varying degrees personnel associated with the Naval Station, the commercial port facilities, and the shipping channel.

The initial exposure caused by the arrival of the ship at anchorage would rapidly decrease as the barges are downloaded and tugged to holding areas along the Glass Breakwater on the northwest end of the harbor. Three to four days should suffice for ship offloading and again at the end of the operation for uploading. Exposures from the anchorages, for both the mother ship and for nested barges, would require identification and acceptance under current DOD criteria. Anchorages cannot be established outside the harbor due to extremely deep water and rough sea conditions. Consideration can also be given to the Naval Station "typhoon-proof" housing techniques in applying standard quantity distance principles of blast overpressure protection from the PREPO operations in Apra Harbor. The U.S. Navy, U.S. Air Force, and U.S. Coast Guard operate facilities on Guam, which also serves as the site of Headquarters, U.S. Naval Forces, Marianas.

Slide #46

Looking south on Apra Harbor here, the team identified that an operational plan could limit the exposure to the time the ship is downloading or uploading barges. Operations with barges at Kilo wharf would be subject to variable sea swells and wind conditions. Swells of 6-8 feet are common 20 percent of the year. Once offloaded, ammunition laydown areas and maintenance and inspection facilities could be provided at Orote Point and Andersen Air Force Base, in compliance with explosives safety requirements.

Slide #47

The Army did conduct PREPO download operations in May and June of this year using facilities at both Fleet Activity, Sasebo, and Akizuki/Hiro Facilities in Japan under strict operational controls. The review and search for alternative locations to improve PREPO explosives safety will continue.

Slide #48

The last port I'll discuss is Chinhae, Korea. It is the sole peacetime port for the import and export of U.S.-titled ammunition arriving in or departing from Korea.

Slide #49

The Headquarters, Department of the Army Task Force Survey Team went to Korea in October 1989. Operations reviewed included the ammunition pier at Chinhae, its support facilities, and the Ducksan Rail Switching Yard. The pier at Chinhae Port operates under an Eighth U.S. Army three million pound waiver. This quantity is based on operational considerations and does not relate to explosives safety limitations required by the DOD standards. The pier is used for five to seven ammunition ships each year.

Slide #50

An on-the-ground survey at the pier, interviews with operating and planning personnel in Korea, and a preliminary map reconnaissance of the area adjacent to the pier determined that exposures were beyond the maximum allowed by the Department of Defense ammunition and explosives safety standards to protect surrounding civilian populations. Exposures exist for quantities of ammunition above 440,000 pounds net explosive weight. Based upon a maximum credible event of three million pounds net explosive weight, Eighth U.S. Army estimates that approximately 1,300 civilian personnel and property valued at over twenty-four million dollars is hazarded in varying degrees. Ammunition is discharged from a breakbulk vessel alongside the pier and placed on the pier for arrangement into carloads.

Slide #51

It is then loaded into open-top gondola cars, blocked and braced, tarped, and moved off the pier to the Ducksan Switching Yard. There, trains are assembled for movement north to storage sites. Container handling capability is not available at Chinhae. A Military Traffic Management Command port analysis indicates that the operating space available at the pier would not accommodate container handling equipment. An Army exemption is currently under review at Headquarters, Department of the Army to acknowledge operations at Chinhae in violation of the DOD standards. There is currently being worked by USFK, a plan to modernize this pier - lengthen, widen, and provide for container handling.

Slide #52

In conclusion, the inability to move munitions through commercial and military ports worldwide and meet the Department of Defense explosives safety standards is recognized. Eventual correction or resolution of all violations

is a long-term goal. This study is to establish the port capabilities and limitations, to identify alternate ports for possible use, and establish the maximum credible event for a typical shipload to identify the potential explosives effects on the individual port and surrounding area should a detonation occur. Also, ways to control or limit the maximum credible event aboard an ammunition ship are to be defined. Ways may include:

- (a) Improved containerization/packaging.
- (b) Ammunition load configuration aboard ship (spacing, buffering/shielding).
- (c) Application of insensitive high explosives.

Slide #53

That concludes my presentation. Thank you for your attention. Should you like more information or have information or activities ongoing in your organizations that relate to this effort, please contact us at the address/phone numbers shown on this slide.

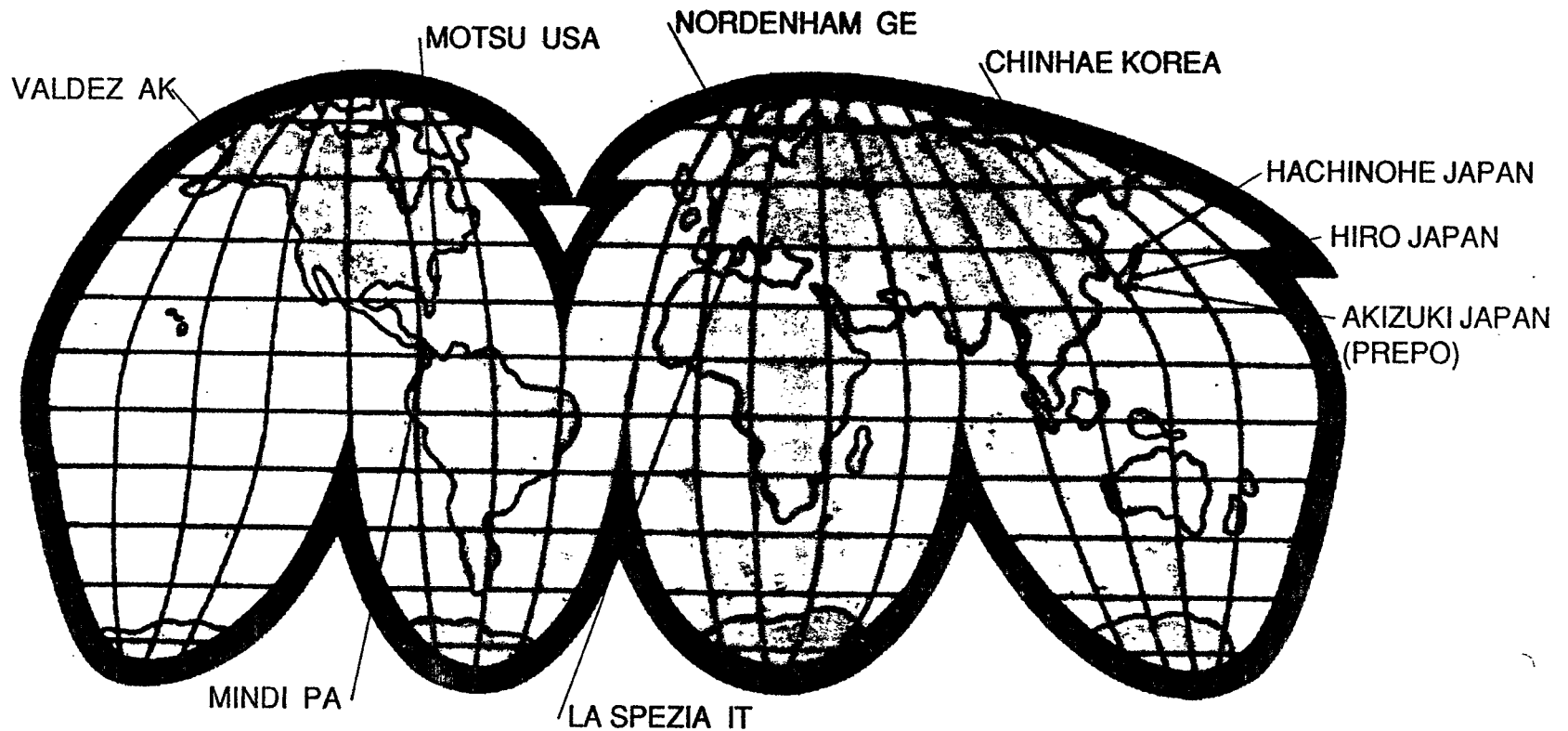
Thank you.

# **WORLDWIDE PORT STUDY**

## **OUTLINE**

- **INTRODUCTION**
- **HISTORICAL CONCERNS**
- **PURPOSE**
- **METHODOLOGY**
- **ACTION PLAN**
- **SURVEYS**
- **CONCLUSION**

# WORLDWIDE PORTS OF INTEREST



1957

# WORLDWIDE PORT STUDY

- **HISTORICAL CONCERNS**

- **1917 - HALIFAX, NOVA SCOTIA**

- **SHIP WITH 5 MILLION POUNDS TNT, GUN COTTON, AND PICRIC ACID**
    - **1800 KILLED, 8000 INJURED, SEVERE DAMAGE**

- **1944 - PORT CHICAGO, CALIFORNIA**

- **AMMO SHIP AND RAILCARS EXPLODED (3.5 MILLION POUNDS) RESULTED IN 320 DEATHS AND EXTENSIVE DAMAGE**

**(THIS DISASTER IS PRINCIPALLY RESPONSIBLE FOR PRESENT DAY DOD STANDARDS FOR PIERS AND WHARVES)**

- **1947 - TEXAS CITY, TEXAS**

- **SHIP INVOLVING 7 MILLION POUNDS OF AMMONIUM NITRATE EXPLODED, 561 DEATHS, 3000 INJURIES AND MAJOR DAMAGE OUT 7000 FEET**

# WORLDWIDE PORT STUDY

- **PURPOSE**

- **TO IDENTIFY CAPABILITIES TO HANDLE MUNITION SHIPMENTS AND THE EXTENT OF VIOLATIONS/EXPOSURES AT ALL PORTS USED BY THE DEPARTMENT OF DEFENSE**
- **TO DETERMINE WAYS OF EVENTUAL CORRECTION OR RESOLUTION OF THE IDENTIFIED VIOLATIONS**



# WORLDWIDE PORT STUDY

- **DIRECTOR OF THE ARMY STAFF DIRECTED THE STUDY - NOV 88**
  - **ARMY DEPUTY CHIEF OF STAFF FOR LOGISTICS INITIATE ACTION TO STUDY ALTERNATE PORTS FOR SHIPPING AMMUNITION TO EUROPE**
  - **ARMY EXECUTIVE DIRECTOR FOR EXPLOSIVES SAFETY ASSESS AMMUNITION PORTS WORLDWIDE TO ESTABLISH MAXIMUM CREDIBLE EVENTS (MCE) FOR TYPICAL SHIPLOADS AND IDENTIFY EXPLOSION EFFECTS**

1960

# WORLDWIDE PORT STUDY

- **METHODOLOGY**

- **WORKING GROUP ESTABLISHED (HQDA, MTMC, EDES)**
  - **STUDY CONCEPT**
  - **ACTION PLAN**
- **RELATED ACTION**
  - **ARMY DEPUTY CHIEF OF STAFF LOGISTICS TASKED THE VARIOUS COMMANDERS IN CHIEF TO IDENTIFY CONTINGENCY PORTS**

**} BRIEFED TO DAS AND APPROVED MAR 89**

# WORLDWIDE LIST OF COMMERCIAL PORTS

✓ ZEEBRUGGE BE  
 GUANTANAMO BAY  
 ACAJUTLA ES  
 ✓ NORDENHAM GE  
 BREMERHAVEN GE  
 WILHELMSHAVEN GE  
 THESSALONIKI GR  
 ✓ GUAM ISLAND  
 ✓ TOMBOLO DOCK IT  
 ✓ LA SPEZIA IT  
 AUGUSTA IT  
 ✓ HIRO JA  
 ✓ HACHINOHE JA  
 YOKOSUKA JA  
 KURE JA  
 SASEBO JA  
 ✓ CHINHAIE ROK  
 ✓ EEMSHAVEN NE  
 TRONDHEIM NE  
 HAMMERNESODDEN NO  
 STEINVIC NO  
 VALNESETT NO  
 NAHA OK  
 ✓ MINDI PIER PA  
 SUBIC BAY PI  
 LISBON PO

ROOSEVELT ROADS PR  
 ROTO SP  
 BANGKOK TH  
 SATTAHIP TH  
 TUNIS TU  
 DERINE TK  
 IZMIR TK  
 ISKENDERUN PORT TK  
 ISKENDERUN ANCH TK  
 GLEN DOUGLAS UK  
 NEWPORT UK  
 BARRY UK  
 ROYAL PORTBURY UK  
 FELIXSTOWE DK UK  
 FELIXSTOWE UK  
 SOUTHAMPTON UK  
 ✓ VALDEZ US  
 WHITTIER US  
 PEARL HARBOR US  
 ✓ SUNNY POINT US  
 CONCORD US

# **WORLDWIDE PORT STUDY**

## **MILITARY PORTS/FACILITIES SURVEYED**

- **HIRO, JAPAN (ARMY)**
- **AKIZUKI, JAPAN (ARMY)**
- **SASEBO, JAPAN (NAVY)**
- **WHITE BEACH AND  
TENGAN PIER, OKINAWA, JAPAN (MTMC/NAVY)**
- **CHINHAE PORT, KOREA (REPUBLIC OF KOREA ARMY)**

# WORLDWIDE PORT STUDY

## ACTION PLAN

1964

<u>ACTION</u>	<u>ACTION AGENCY</u>	<u>MILESTONE</u>	<u>STATUS</u>
MINDI/RODMAN (PANAMA) SURVEY	#USATCES	FEB 89	•
EEMSHAVEN (NETHERLANDS) SURVEY	#USATCES	APR 89	•
IDENTIFY ALL PORTS USED FOR CLASS V SHIPPING (PEACETIME)	#MTMC	29 MAR 89	•
IDENTIFY AMMUNITION PORTS USED IN LAST TWO YEARS	#MTMC/USATCES	29 MAR 89	•
HIRO TASK FORCE	#USATCES/MTMC/DALO	24-30 JUN 89	•
JCS MESSAGE TO CINCS	#DALO	26 JUL 89	•
FIRST IPR	#USATCES/ALL	5 SEP 89	•
DETAILED QUESTIONNAIRE SENT TO CINCS	#DALO	9 JAN 90	•
CHINHAE TASK FORCE	#USATCES/MTMC/DALO	23 OCT - 1 NOV 89	•
DA/WESTCOM TASK FORCE	#USATCES/DALO	20 JAN - 2 FEB 90	•
SECOND IPR	#USATCES/ALL	17 APR 90	•

(# LEAD AGENCY)

(• ACTION COMPLETE)

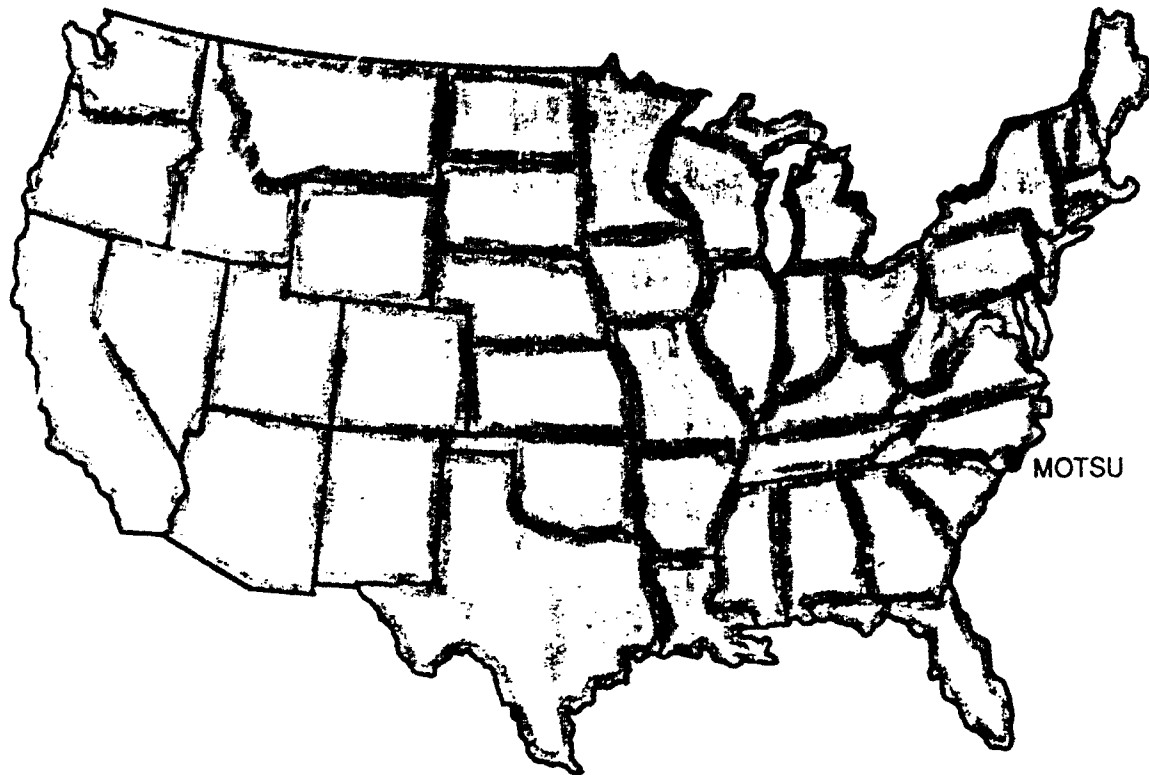
# WORLDWIDE PORT STUDY

## ACTION PLAN CONT.

<u>ACTION</u>	<u>ACTION AGENCY</u>	<u>MILESTONE</u>	<u>STATUS</u>
DALO FOLLOWUP W/CINCS	#DALO	10 MAY 90	
COLLECT SITE SPECIFIC PORT DATA			
--TONNAGES, FREQUENCY OF USE, VESSELS, LOAD CONFIGURATION	#MTMC/USATCES	30 MAY 90	
COLLECT SITE SPECIFIC DATA			
--DATA SET INFORMATION	#DALO	15 JUN 90	
DATA ANALYSIS	#USATCES	30 SEP 90	
PREPO CONSIDERATIONS	#USATCES/DALO	JUL - SEP 90	
THIRD IPR	#USATCES/ALL	OCT 90	
IDENTIFICATION OF MITIGATING/CORRECTIVE MEASURES/VISITS	#USATCES/ALL	OCT - DEC 90	
LAST IPR	#USATCES/ALL	FEB 91	
GENERATE/COORDINATE RESULTS	#USATCES/ALL	MAR 91	
PUBLISH REPORT/BRIEF DAS	#USATCES	APR 91	

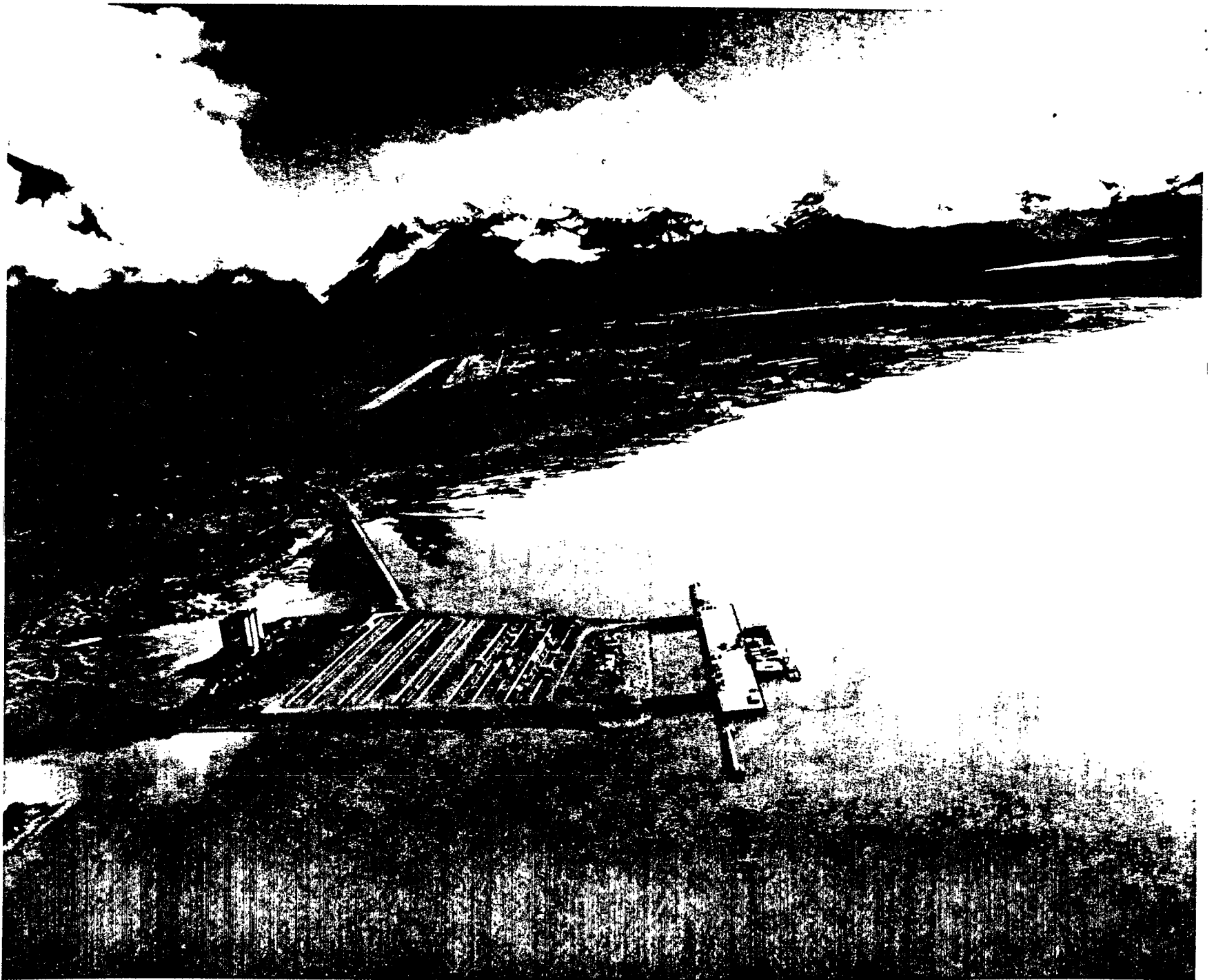
(# LEAD AGENCY)

# UNITED STATES



1966

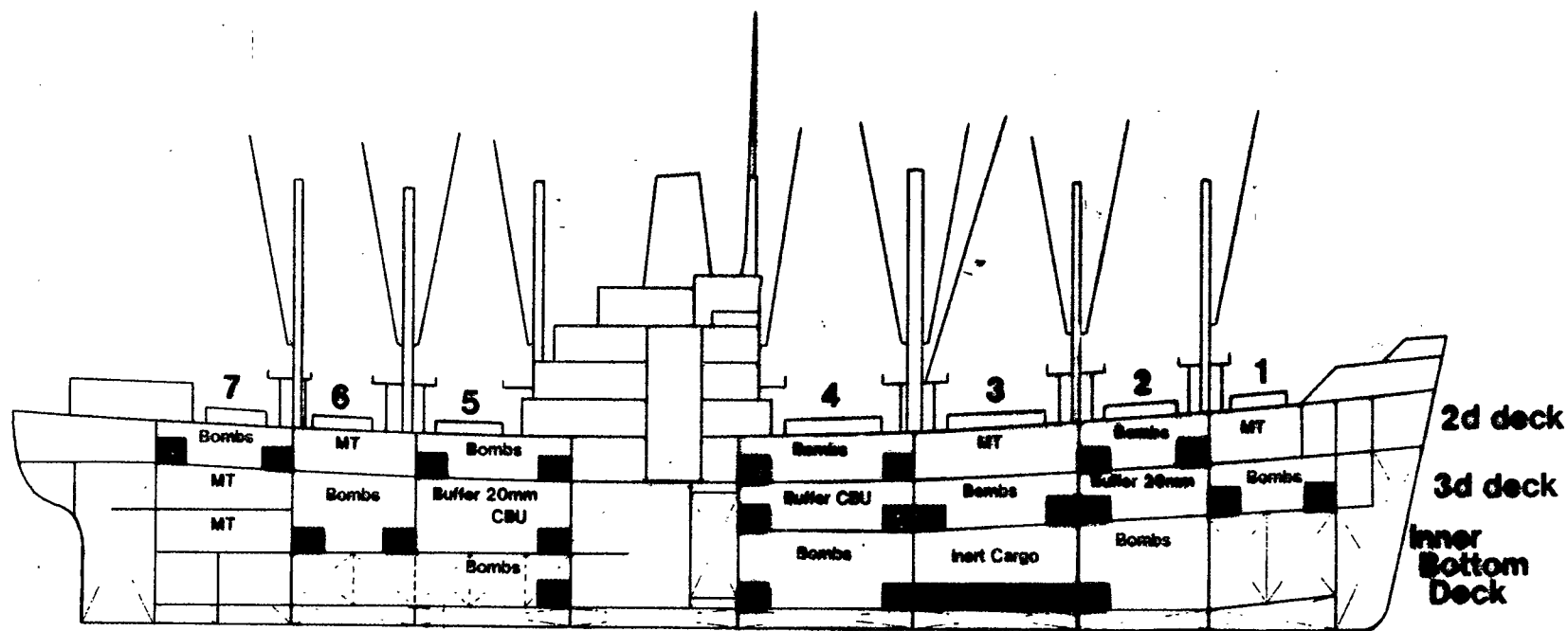
1967





# **S. S. Dawn** Length - 572 ft.

1983



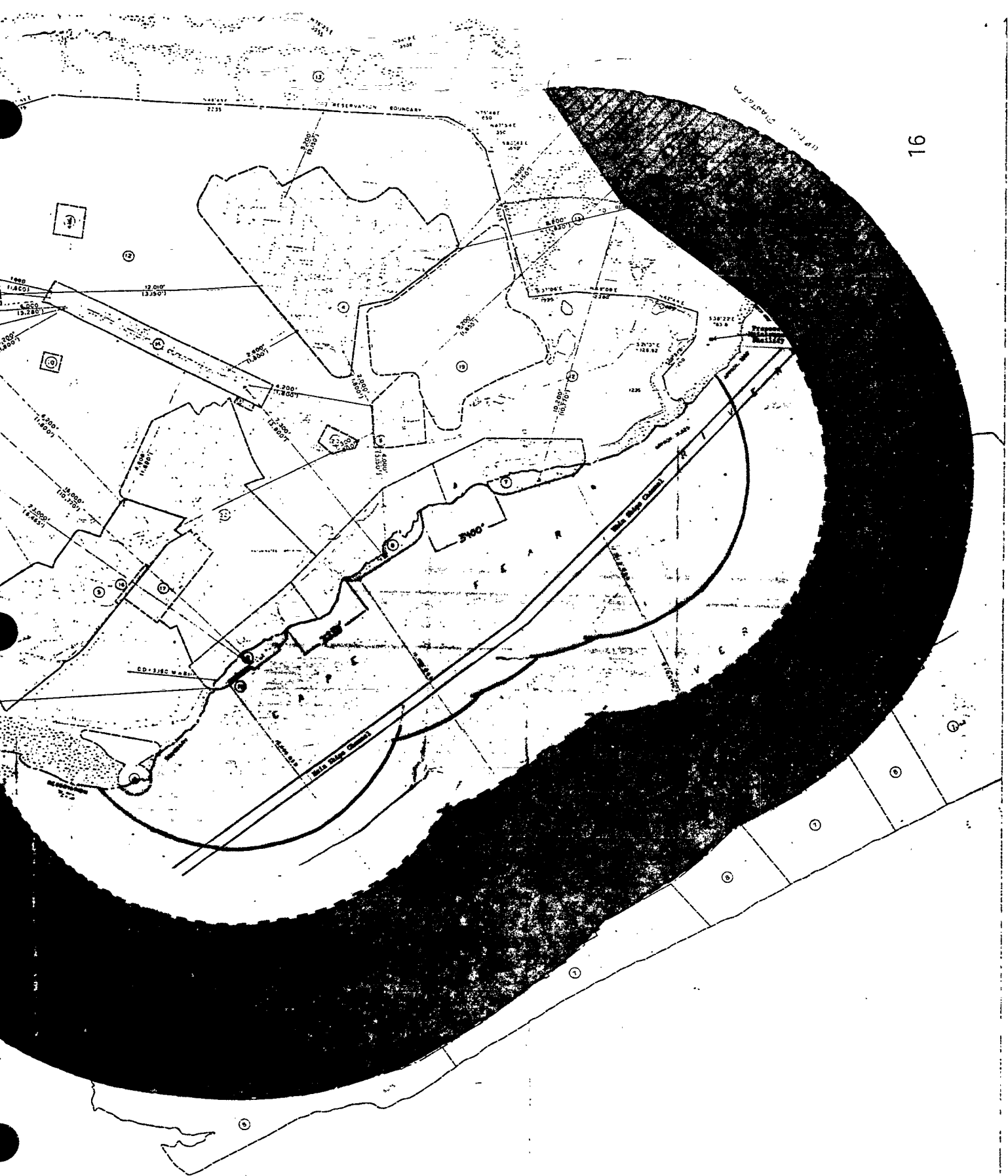
- Bombs
- Buffer (CBU & 20mm)
- Fins - Inert

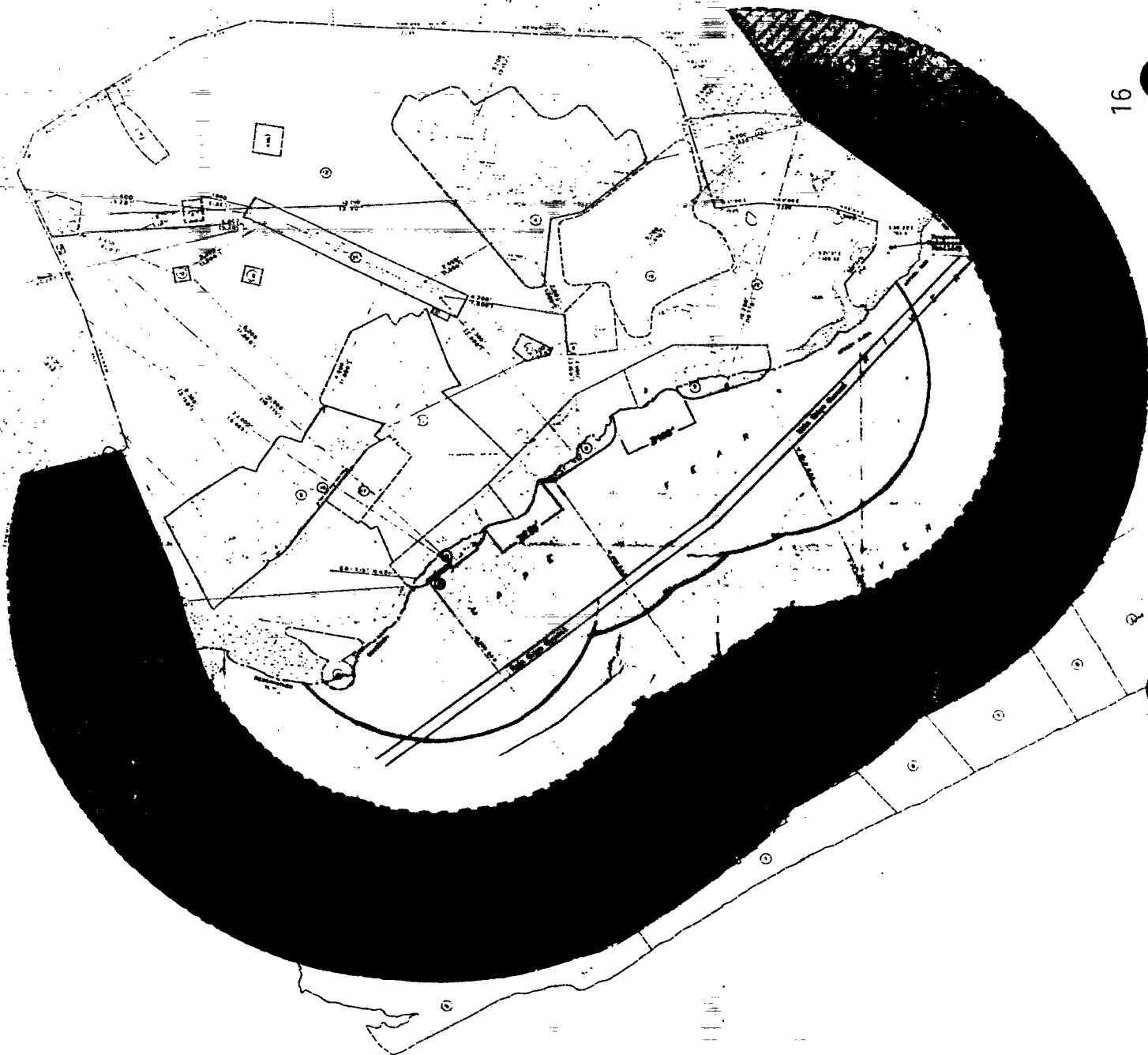
1969



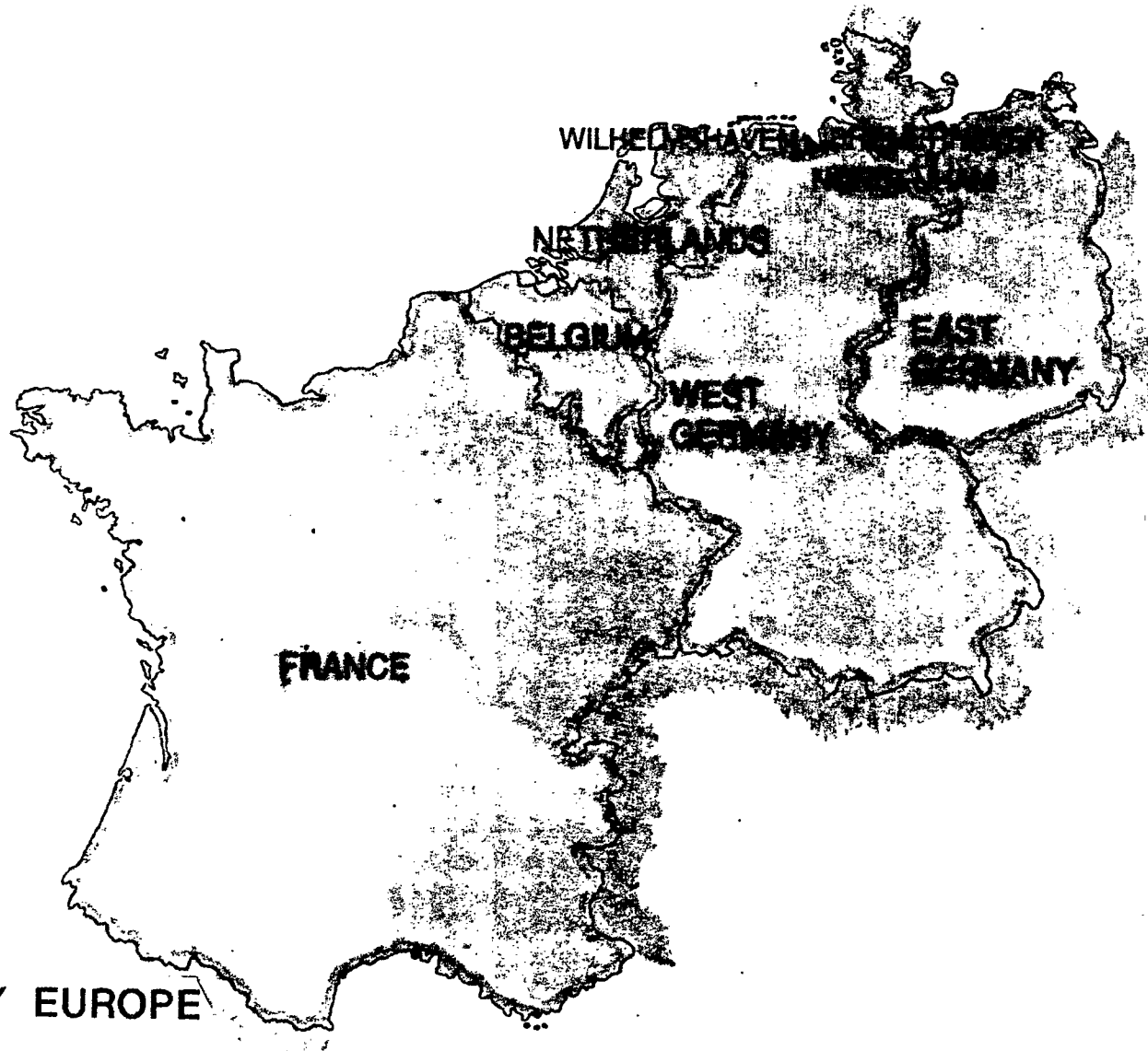
MILITARY OCEAN TERMINAL, SUNNY POINT







# NORTH EUROPE

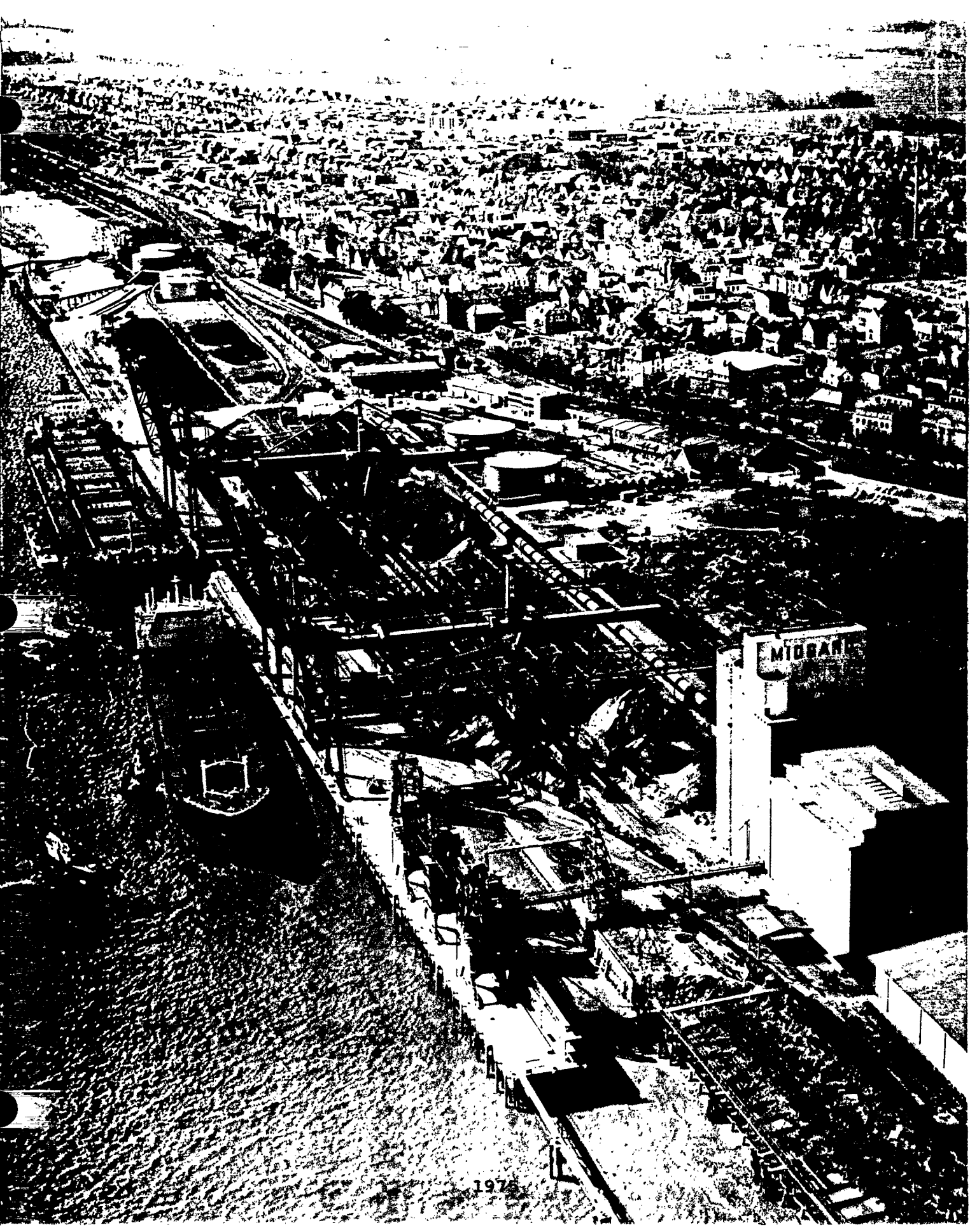


U.S. ARMY EUROPE

# WORLDWIDE PORT STUDY

- **NORDENHAM, GE**
  - **COMMERCIAL PORT**
  - **ONLY PORT CURRENTLY USED FOR AMMUNITION INTO NORTHERN EUROPE**
  - **OPERATED UNDER AN ANNUAL WAIVER IN PAST**
  - **3,000,000 LBS MAXIMUM NEW**
    - **ENDANGERS APPROXIMATELY 30,000 PEOPLE AND THEIR PROPERTY**
  - **ASA(IL&E) EXEMPTION PROVIDED IN SEP 88 (3 YEARS)**

1974

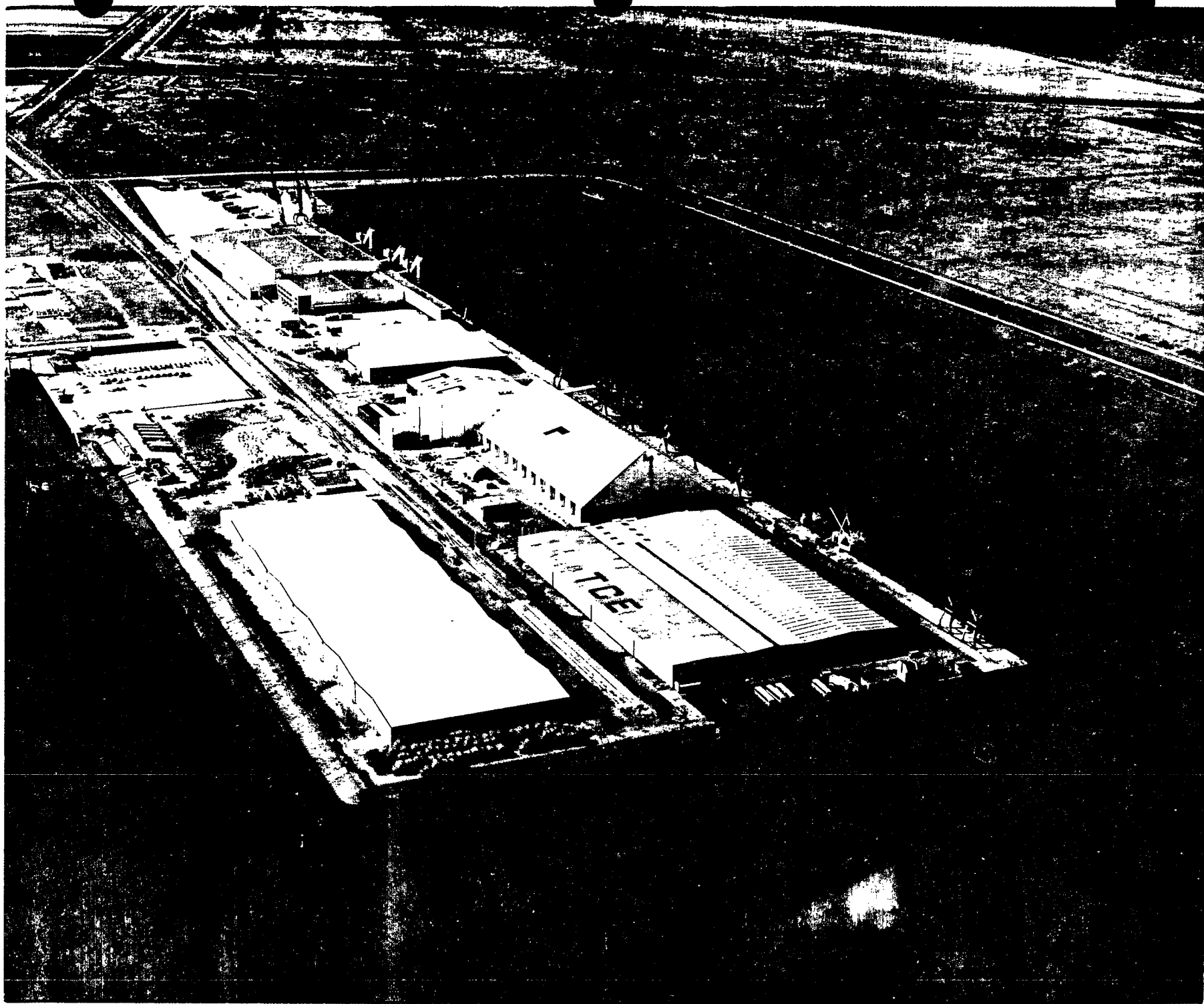




# **WORLDWIDE PORT STUDY**

- **EEMSHAVEN, NE**
  - **COMMERCIAL PORT**
  - **ACCOMMODATED TEST SHIPMENT OF AMMUNITION**
  - **LIMITED EXPOSURES**
  - **USAREUR ACTIONS TO DETERMINE FEASIBILITY**

1976



# CENTRAL AMERICA



1978

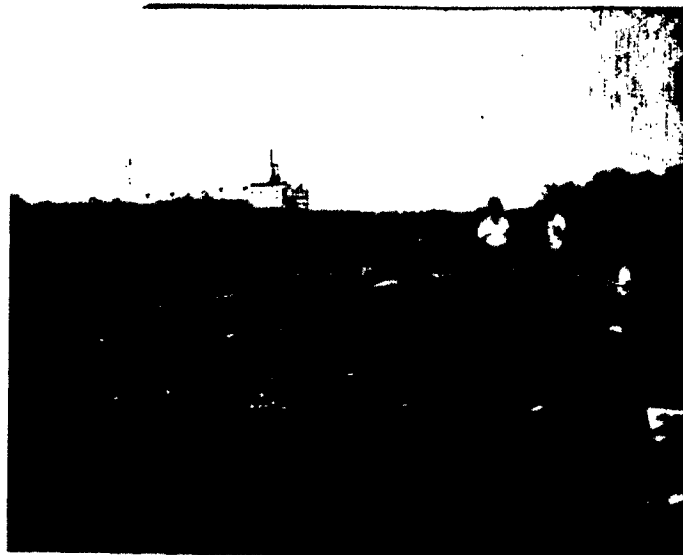
U.S. ARMY SOUTH

# WORLDWIDE PORT STUDY

- **MINDI PIER, PANAMA**
  - **COMMERCIAL PORT**
  - **LOCATED ON THE PANAMA CANAL (ATLANTIC SIDE)**
  - **OPERATES UNDER A WAIVER**
  - **60,000 LBS NEW CAPABILITY**
    - **EXPOSURES ARE MAIN SHIP CHANNEL AND PANAMA CANAL RAILROAD**
  - **U.S. ARMY SOUTH IS CONSIDERING AN EXEMPTION REQUEST**

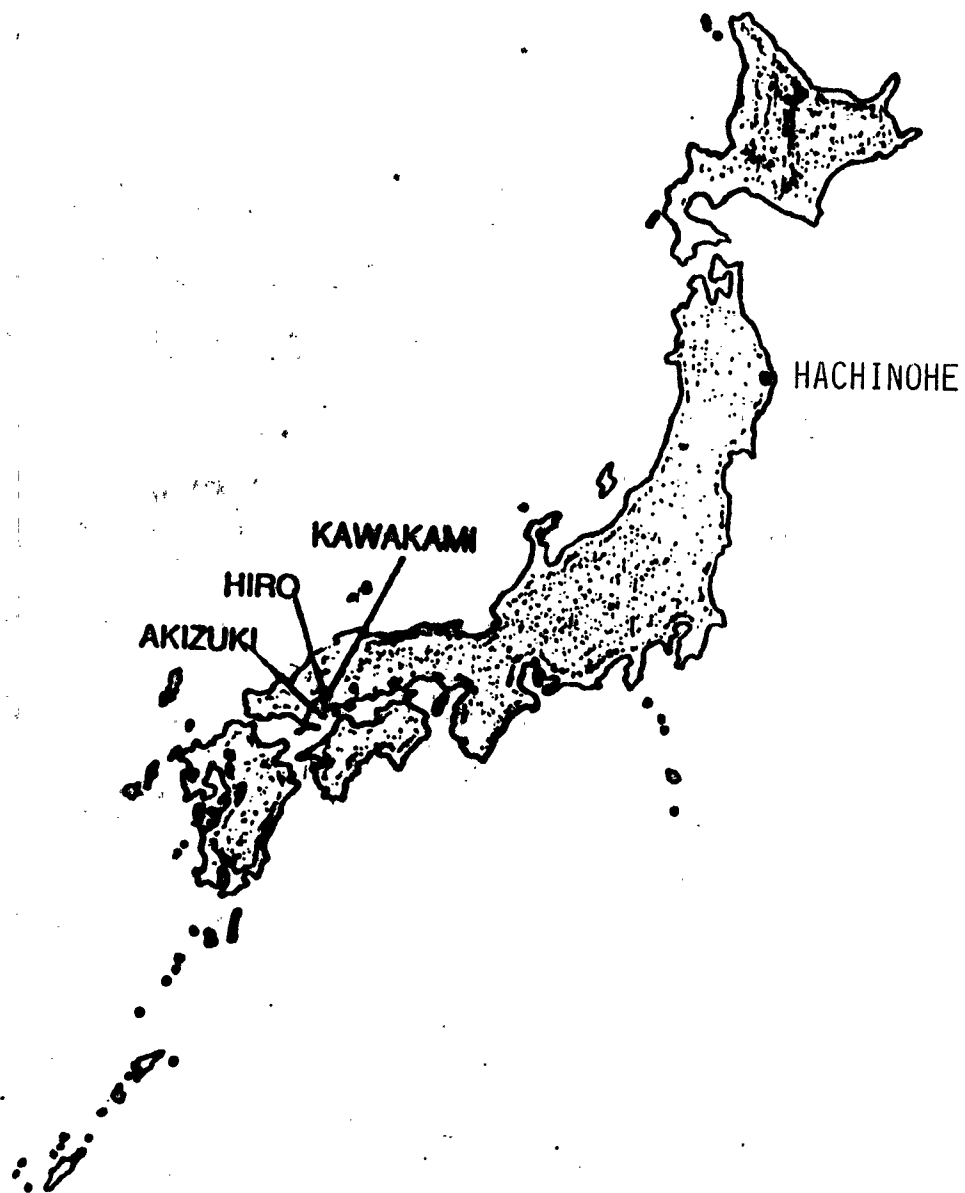
1979

1980



MINDI PIER, PANAMA

# JAPAN



1981

U.S. ARMY JAPAN

# WORLDWIDE PORT STUDY

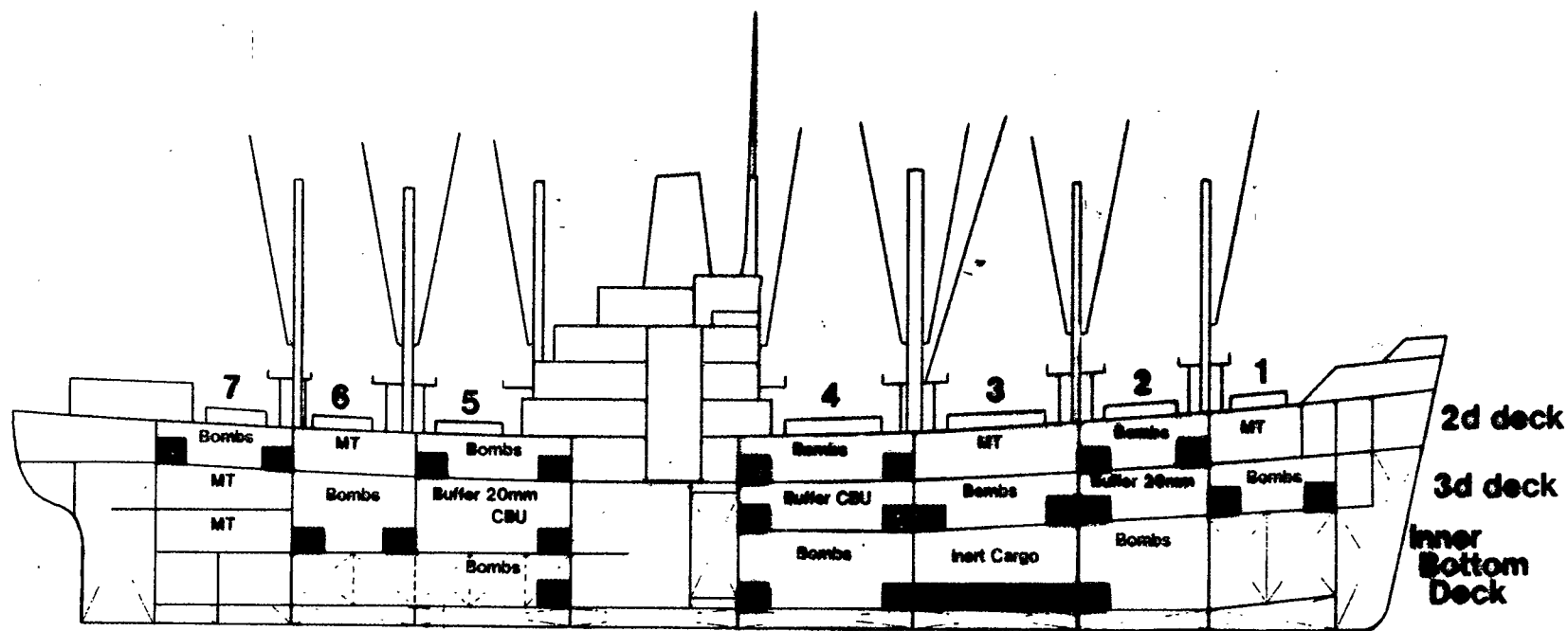
- **HACHINOHE PORT, JAPAN**
  - **COMMERCIAL PORT**
  - **DOD SURVEY 1987, 40,000 LBS NEW CAPABILITY (WHARF E)**
  - **COMMANDING GENERAL USARJ WAIVER 890,000 LBS NEW**
    - **3 SHIPLOADS, AIR FORCE BOMBS (SUPPLY MISAWA AIR FORCE BASE)**
    - **EXPOSURE TO HOST NATION POPULATION/FACILITIES**
  - **INTERSERVICE WORKING GROUP**
    - **BUFFERED CONFIGURATION**
    - **REDUCED MCE TO 80,000 LBS**

1982

# S. S. Dawn

Length - 572 ft.

1983

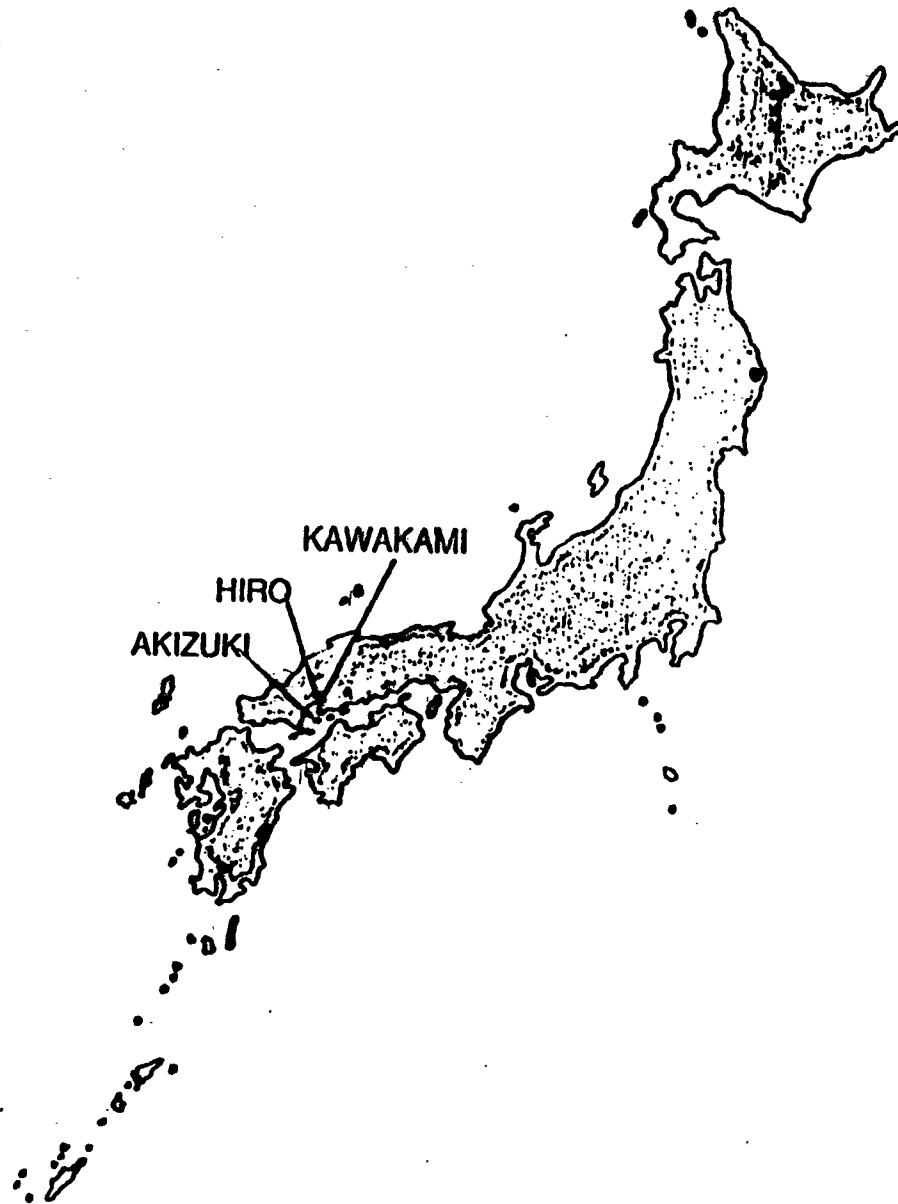


- Bombs
- Buffer (CBU & 20mm)
- Fins - inert



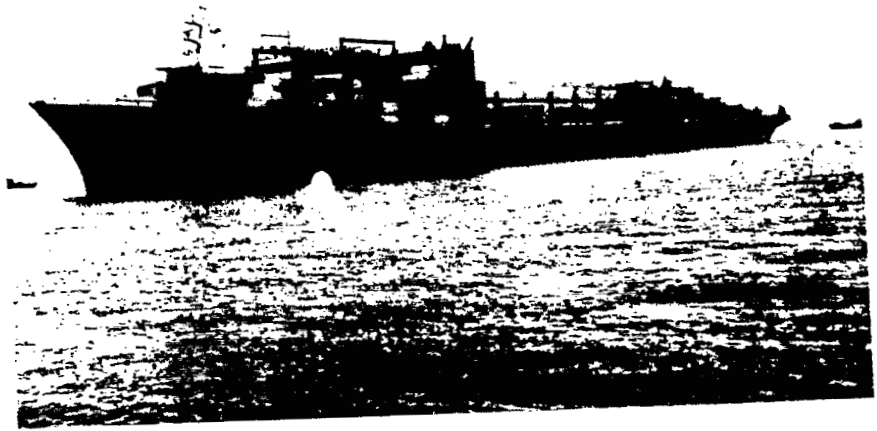


# JAPAN



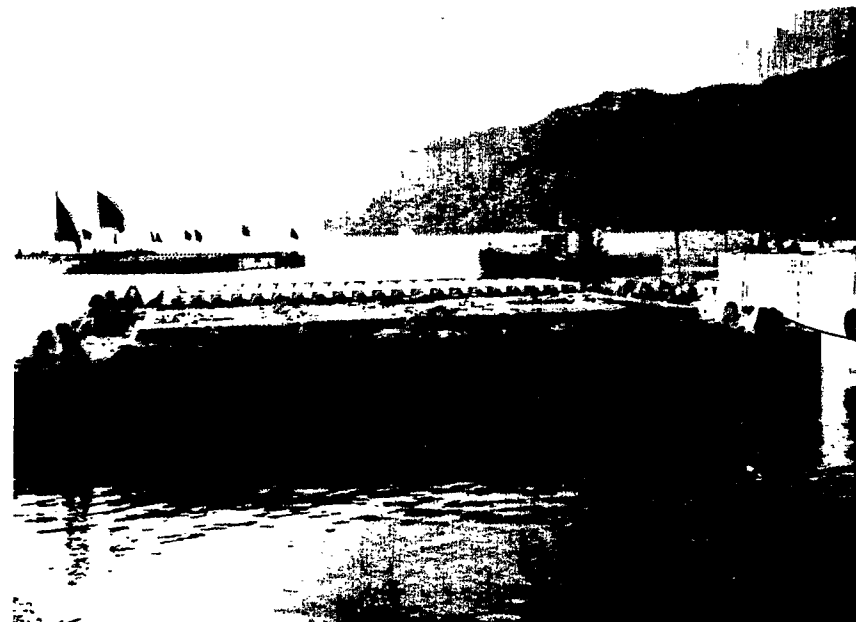
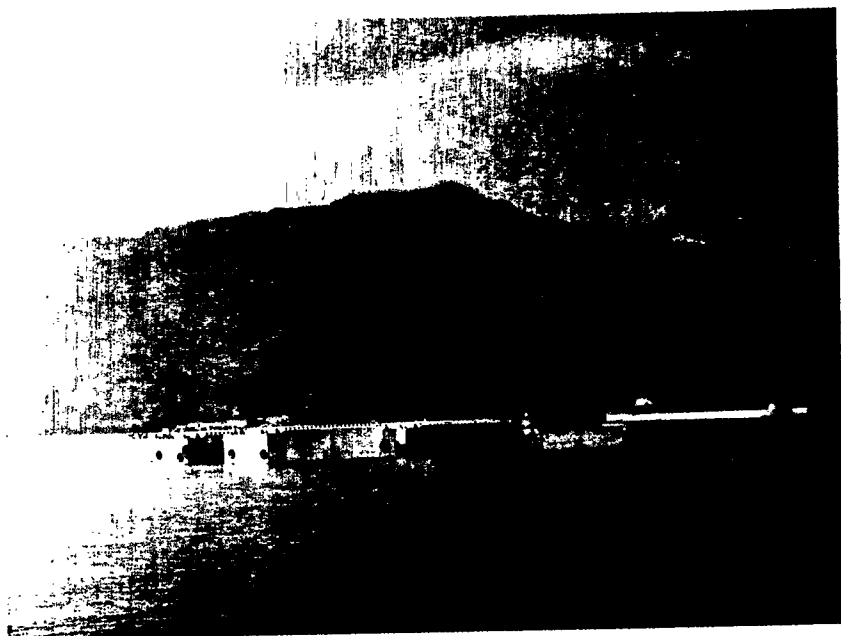
1985

U.S. ARMY JAPAN

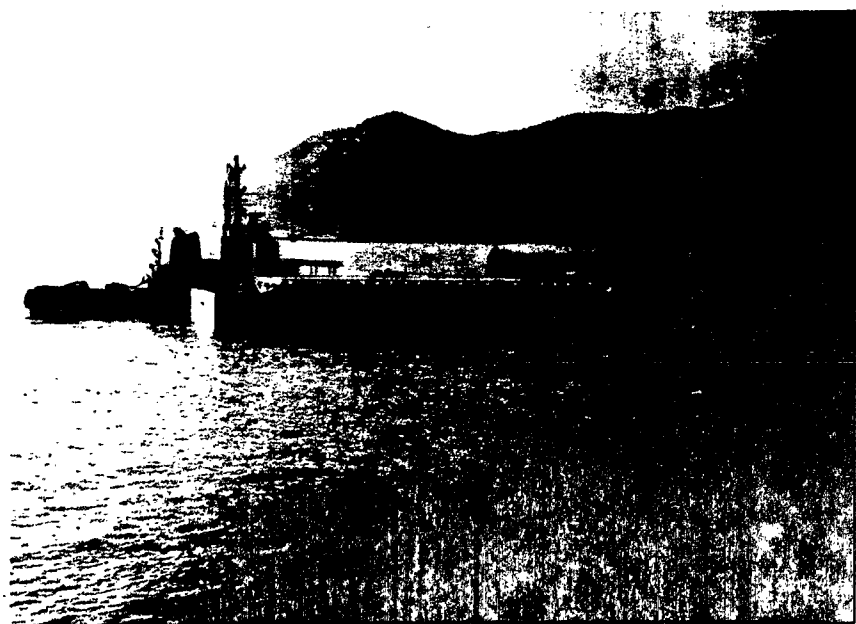
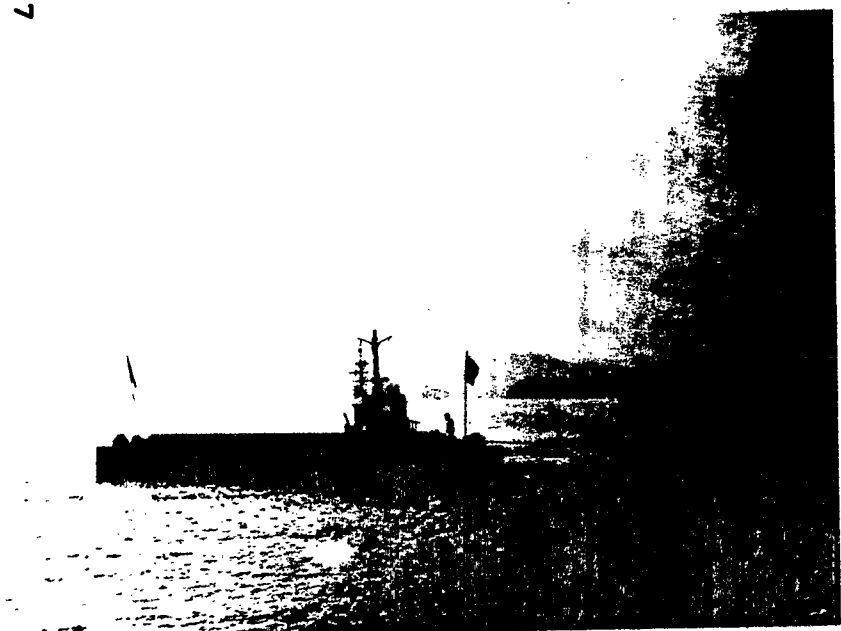


1986

GREEN HARBOR



1987



886T

# HIRO STORAGE AREA

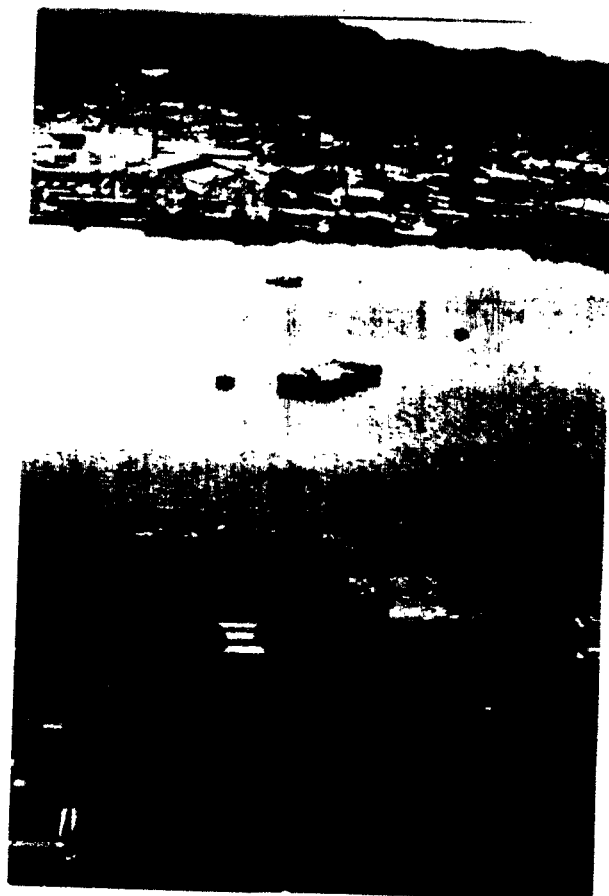


# WORLDWIDE PORT STUDY

- **HIRO PIER, JAPAN**
  - **U.S. ARMY FACILITY**
  - **LOCATED APPROX 400 MILES SW OF TOKYO**
  - **AMMUNITION STORAGE LIMITED**
    - **LACK OF REAL ESTATE**
  - **PIER UNDER MACOM WAIVER**
  - **HQDA TASK FORCE TEAM EVALUATION OF PREPO OPERATIONS/ANCHORAGE**
  - **COMMANDER USARJ REQUEST FOR AN ASA(IL&E) CERTIFICATION FOR COMPELLING REASONS APPROVED AUG 89**

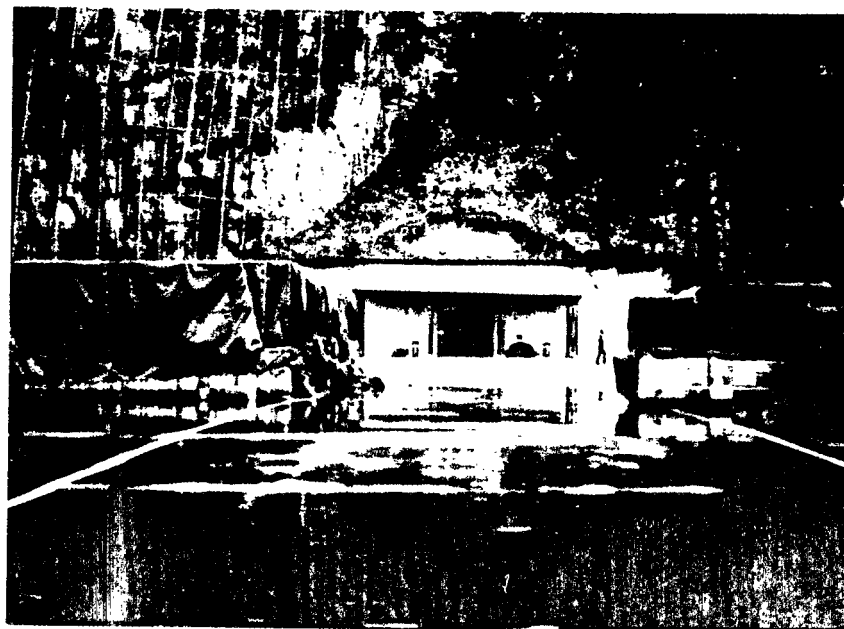
1989

1990



FROIT OF CAVE  
HIRO

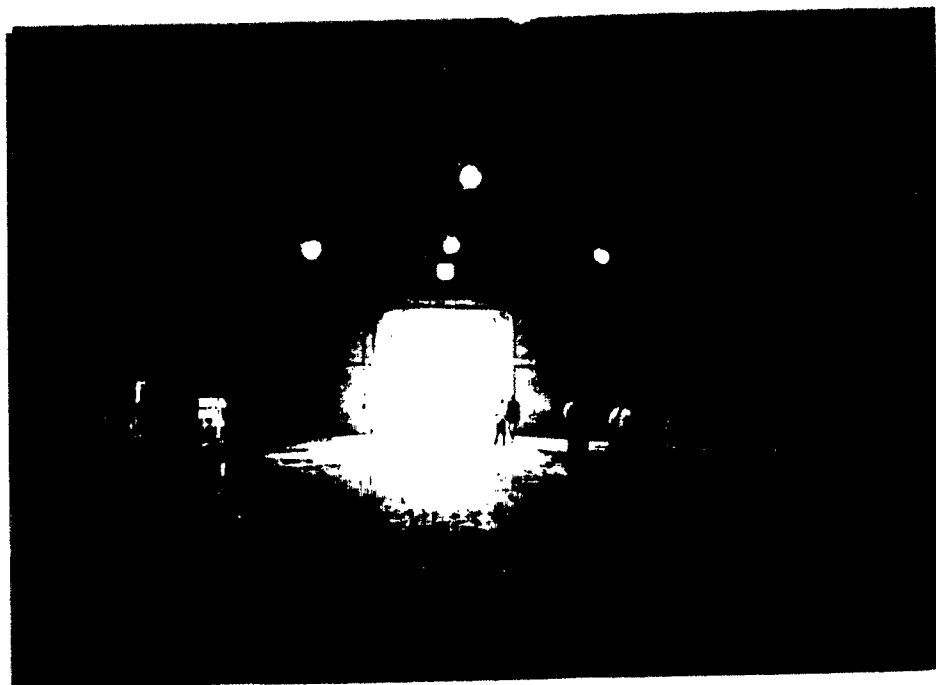
1991



CAVE FRONT  
HIRO



1992



INSIDE OF CAVE  
HIRO

866T

AKIUKI STORAGE AREA



# WORLDWIDE PORT STUDY

- **AKIZUKI DEPOT COMPLEX, JAPAN**
  - **U.S. ARMY FACILITY ACROSS KURE BAY**
  - **LIMITED CAPABILITIES BASED ON EXPOSURES**
    - **VILLAGES, KOYO 2481 PEOPLE AND AKIZUKI 916 PEOPLE**
    - **WATER TRAFFIC IN KURE BAY**
  - **OPERATES UNDER MACOM WAIVERS**
  - **PREPO OPERATIONS**

1994

# WORLDWIDE PORT STUDY

- SEARCH FOR ALTERNATIVES FOR PREPO CONTINUED
- JAN 90 - CG WESTCOM REQUESTED HQDA SURVEY PORT FACILITIES ON:
  - OKINAWA
  - JAPAN
  - GUAM

1995

TENGAN PIER

1996



# WHITE BEACH

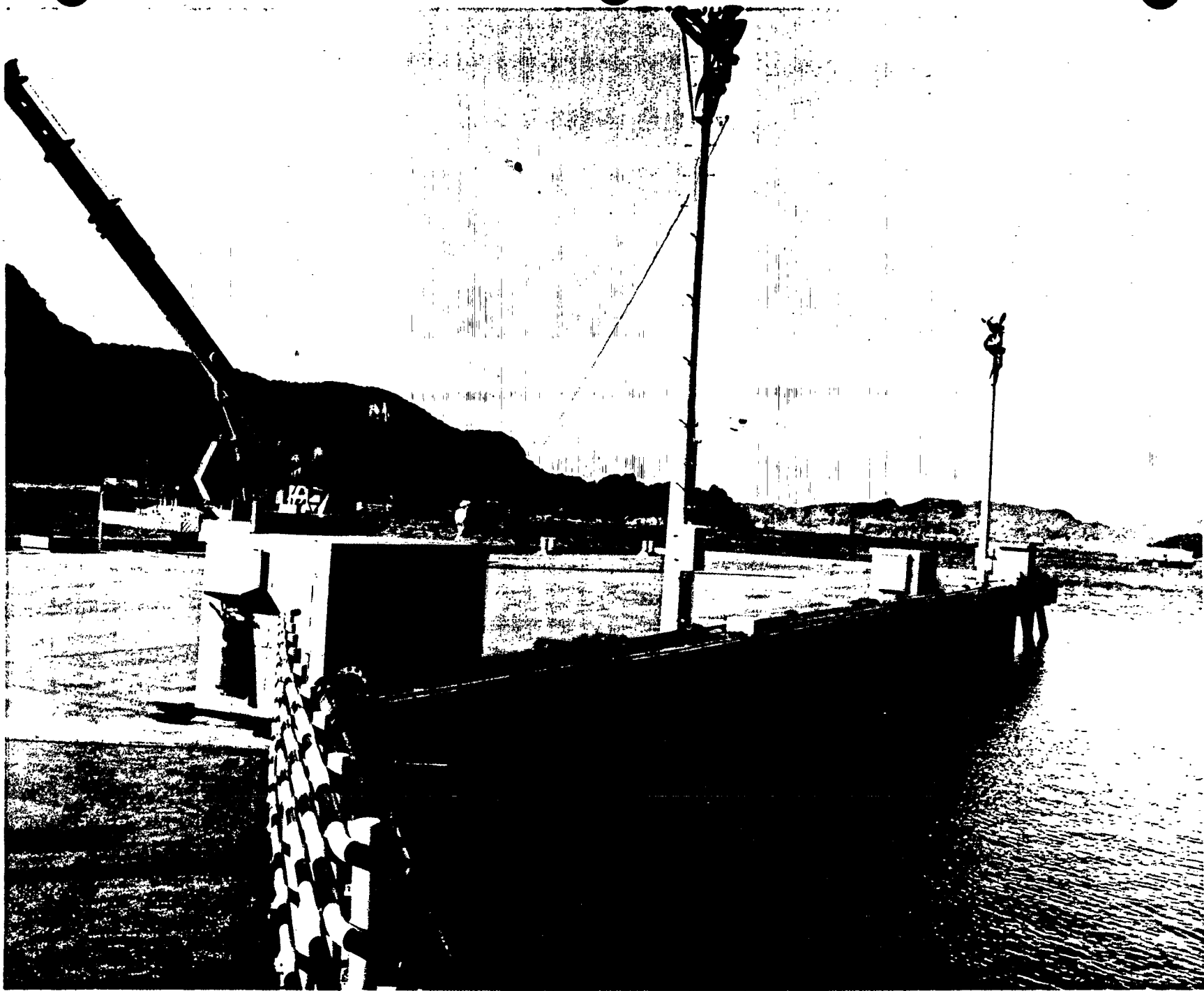


1997



IN CASE OF FIRE  
火災通報は  
CALL 117  
FIRE STATION

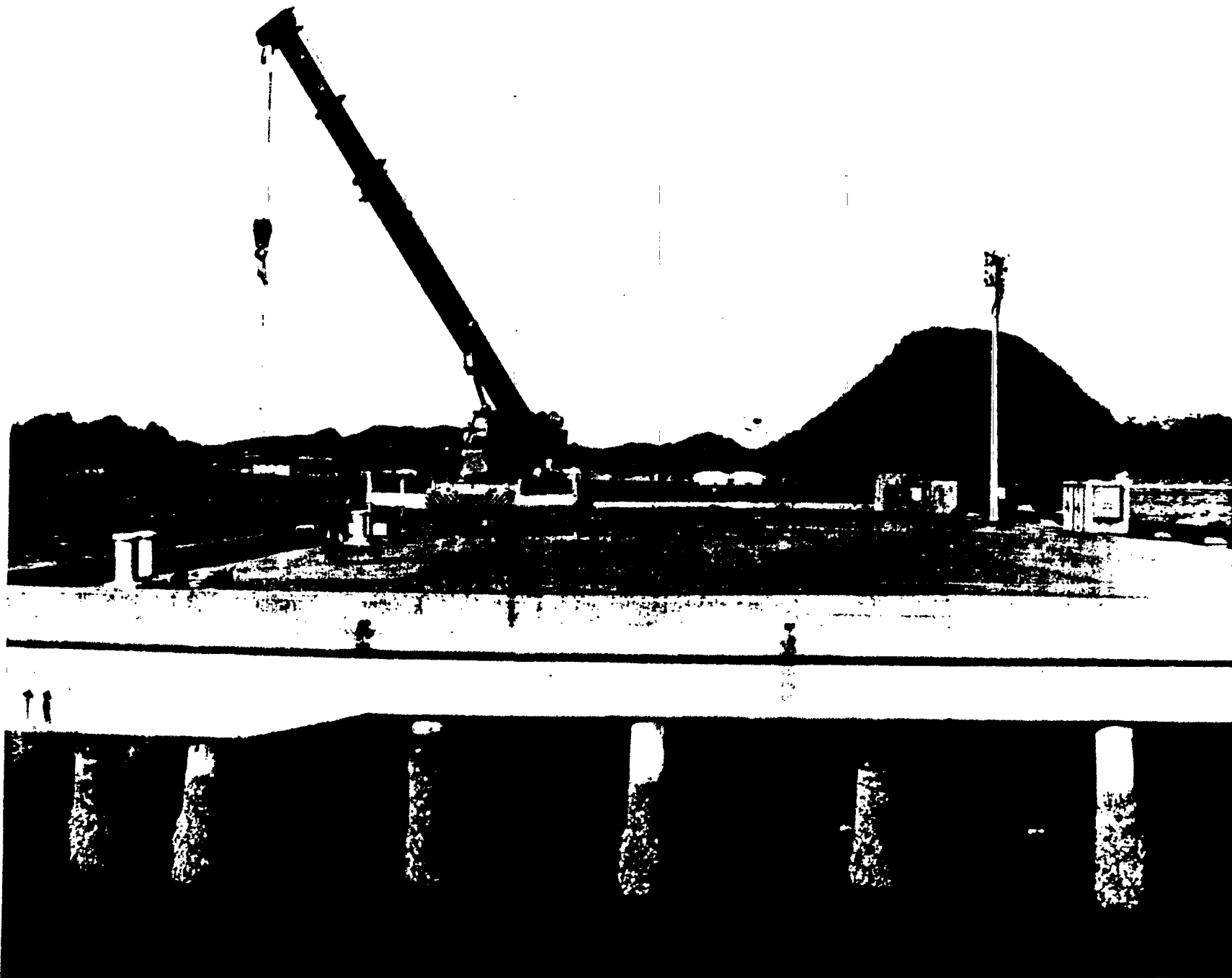
1999



SASEBO WHARF



2000

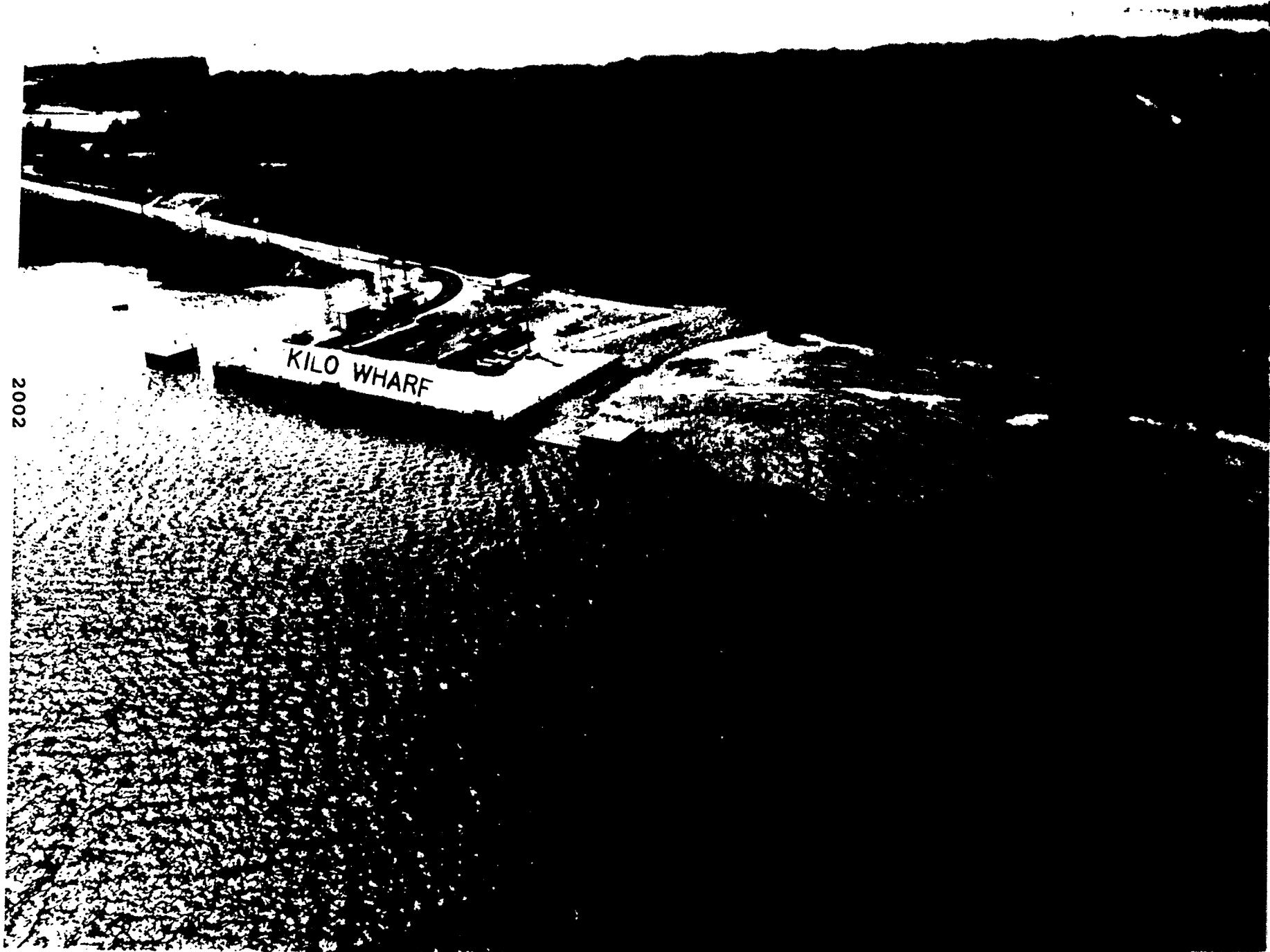


SASEBO WHARF



GUAM - APRA HARBOR

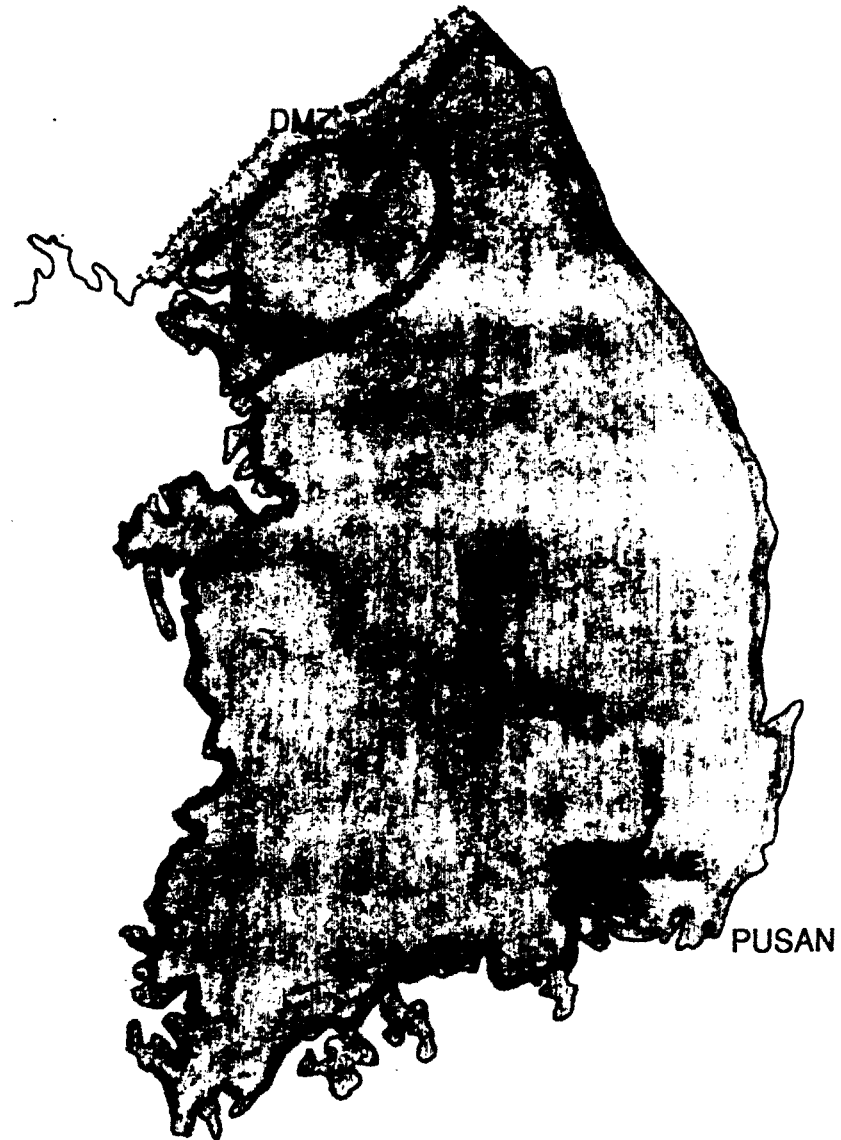
2002



## **WORLDWIDE PORT STUDY**

- **MAY - JUN 90**
  - **PREPO OPERATIONS WERE CONDUCTED AT FLEET  
ACTIVITY SASEBO AND AKIZUKI/HIRO FACILITIES**
  - **REVIEW OF ALTERNATE LOCATIONS WILL CONTINUE**

# SOUTH KOREA

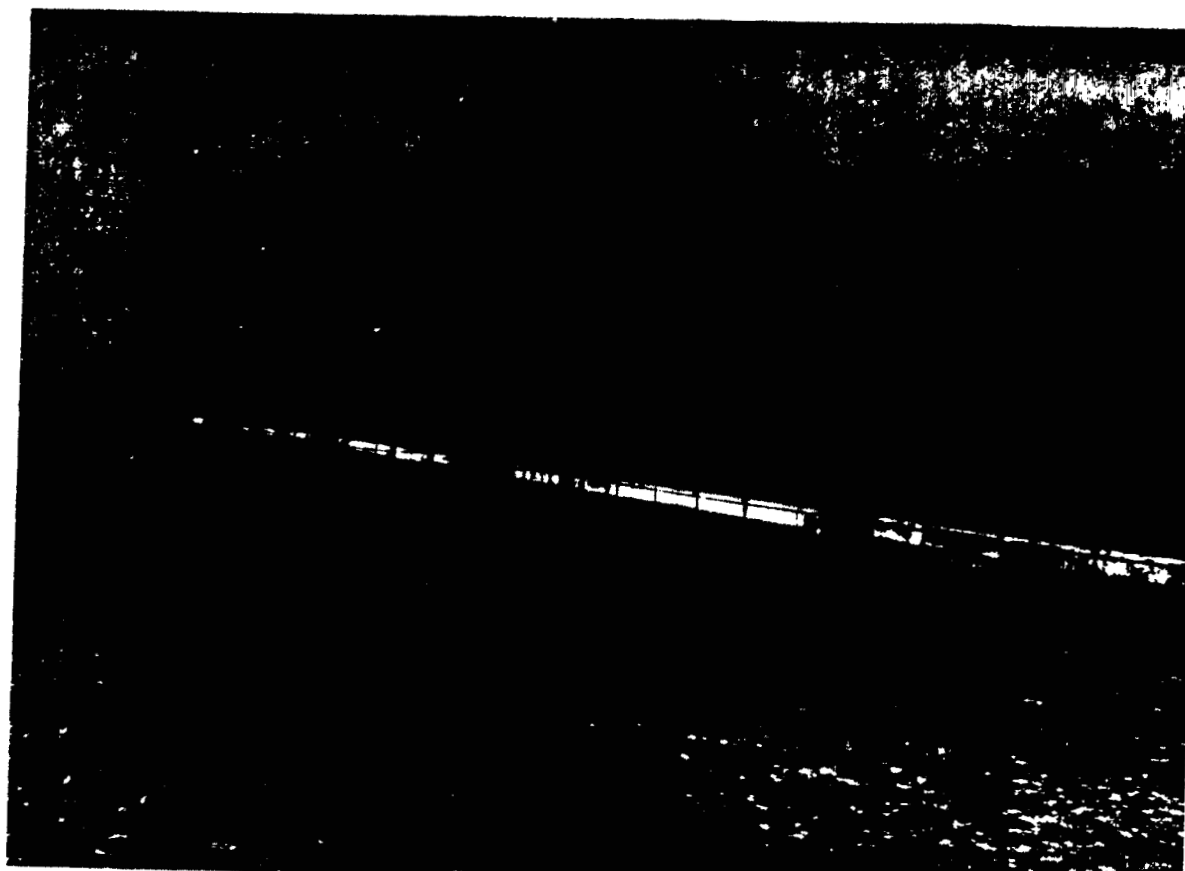


576,700 SHORT TONS

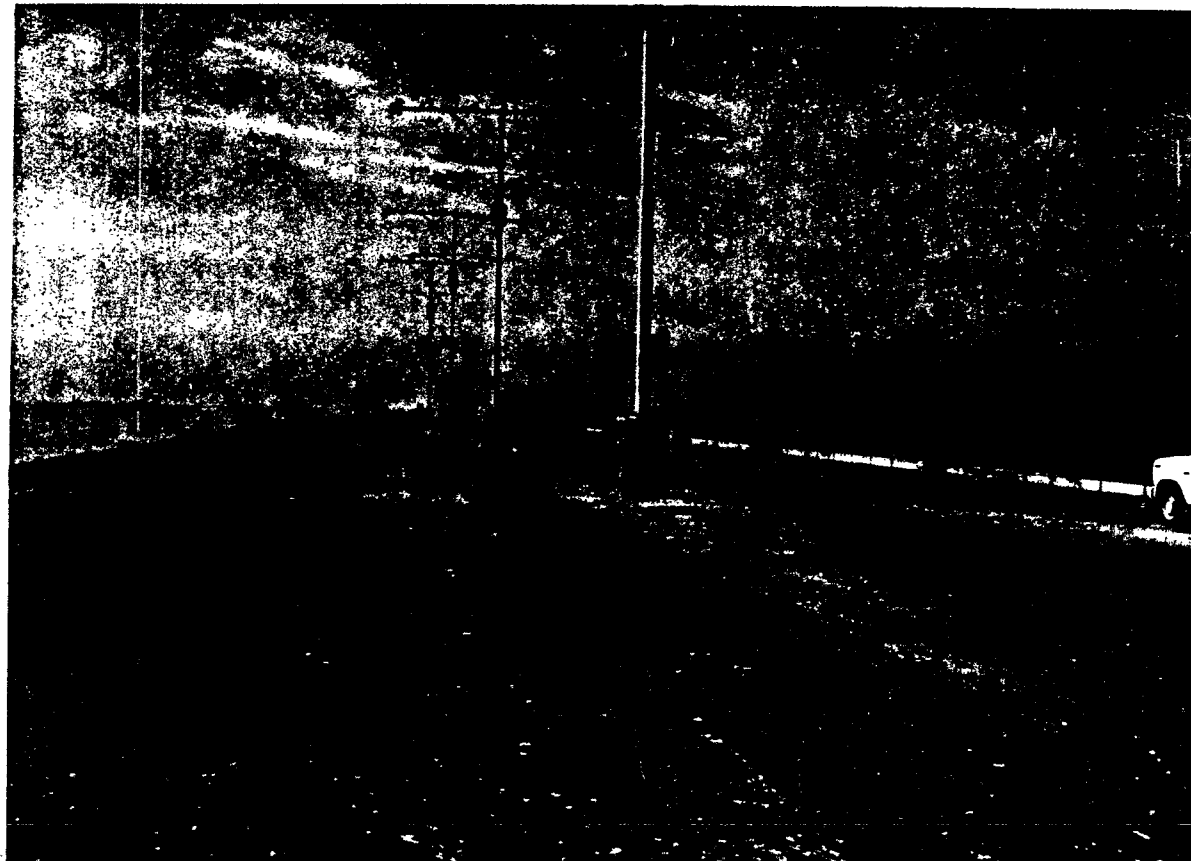


CHINHAE PIER

2006



CHINHAE PIER



CHINHAE PIER



# **WORLDWIDE PORT STUDY CONCLUSION**

- **THE PROCESS IS TO ESTABLISH:**
  - **CURRENT PORT CAPABILITIES/LIMITATIONS**
  - **VESSELS USED (FREQUENCY AND TONNAGES)**
  - **STORAGE CONFIGURATIONS AND NEW**
  - **EXPLOSIVES EFFECTS ON PORTS AND SURROUNDINGS**
  - **WAYS TO CONTROL/LIMIT THE MCE**
    - **CONTAINERIZATION/PACKAGING**
    - **STOWAGE/LOAD CONFIGURATIONS  
SPACING/BUFFERING/SHIELDING**
    - **INSENSITIVE MUNITIONS**

# **WORLDWIDE PORT STUDY**

## **ADDRESS:**

**DIRECTOR, U.S. ARMY TECHNICAL CENTER  
FOR EXPLOSIVES SAFETY, ATTN: SMCAC-ES,  
SAVANNA, IL 61074-9639**

## **TELEPHONE:**

<b>COMMERCIAL</b>	<b>(815) 273-8802</b>
<b>DSN</b>	<b>585-8802</b>
<b>DATAFAX</b>	<b>585-8769</b>