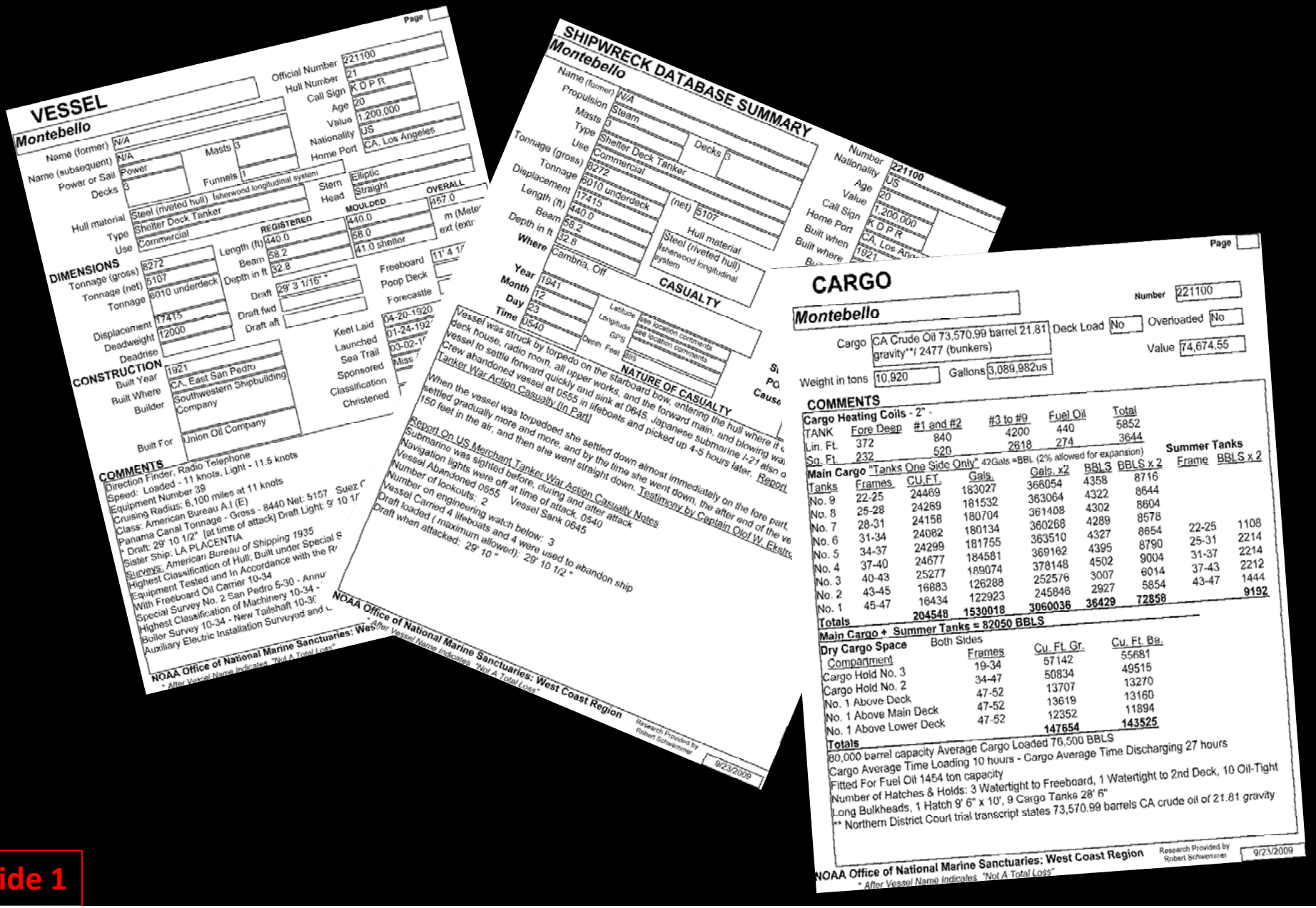
Montebello Assessment Task Force Meeting
October 1, 2009
Monterey Bay Aquarium Research Institute

Update of Vessel Records

Presented by
Robert Schwemmer
NOAA-Office of National Marine Sanctuaries
West Coast Region

Montebello database records with construction data last updated 09/23/09



VESSEL

Montebello

Name (former) N/A
Name (subsequent) N/A
Power or Sail Power
Decks 3
Masts 3
Funnels 1
Hull material Steel (riveted hull) Isherwood longitudinal system
Type Shelter Deck Tanker
Use Commercial
Official Number 221100
Hull Number 21
Call Sign K D P R
Age 20
Value 1,200,000
Nationality US
Home Port CA, Los Angeles
Stern Elliptic
Head Straight

DIMENSIONS

	REGISTERED	MOULDED	OVERALL
Tonnage (gross) 8272	Length (ft) 440.0	440.0	457.0
Tonnage (net) 5107	Beam 58.2	58.0	m (Meter
Tonnage 6010 underdeck	Depth in ft 32.8	41.0 shelter	ext (extr
Displacement 17415	Draft 29' 3 1/16" *	Freeboard 11' 4 1/	
Deadweight 12000	Draft fwd	Poop Deck	
Deadrise	Draft aft	Forecastle	

CONSTRUCTION

Built Year 1921
Built Where CA, East San Pedro
Builder Southwestern Shipbuilding Company
Built For Union Oil Company
Keel Laid 04-20-1920
Launched 01-24-192
Sea Trail 03-02-1
Sponsored Miss
Classification
Christened

COMMENTS

Direction Finder, Radio Telephone
Speed: Loaded - 11 knots, Light - 11.5 knots
Equipment Number 39
Cruising Radius: 6,100 miles at 11 knots
Class: American Bureau A.I (E)
Panama Canal Tonnage - Gross - 8440 Net: 5157 Suez G
* Draft: 29' 10 1/2" [at time of attack] Draft Light: 9' 10 1/
Sister Ship: LA PLACENTIA
Surveys: American Bureau of Shipping 1935
Highest Classification of Hull: Built under Special S
Equipment Tested and In Accordance with the R
With Freeboard Oil Carrier 10-34
Special Survey No. 2 San Pedro 5-30 - Annu
Highest Classification of Machinery 10-34 -
Boiler Survey 10-34 - New Tailshaft 10-3
Auxiliary Electric Installation Surveyed and

NOAA Office of National Marine Sanctuaries: West Coast Region
* After Vessel Name Indicates "Not A Total Loss"

SHIPWRECK DATABASE SUMMARY

Montebello

Name (former) N/A
Propulsion Steam
Masts 3
Type Shelter Deck Tanker
Use Commercial
Tonnage (gross) 8272
Tonnage 6010 underdeck
Displacement 17415
Length (ft) 440.0
Beam 58.2
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Where Cambria, Off
Decks 3
(net) 5107
Hull material Steel (riveted hull) Isherwood longitudinal system
Number 221100
Nationality US
Age 20
Value 1,200,000
Call Sign K D P R
Home Port CA, Los Ang
Built when 1921
Built where

CASUALTY

Year 1941
Month 12
Day 23
Time 0540
Latitude
Longitude
GPS
Depth, Feet 555
See location comments
See location comments

NATURE OF CASUALTY

Vessel was struck by torpedo on the starboard bow, entering the hull where it s
deck house, radio room, all upper works, and the forward main, and blowing wa
vessel to settle forward quickly and sink at 0645. Japanese submarine I-21 also a
Crew abandoned vessel at 0555 in lifeboats and picked up 4-5 hours later. Report
Tanker War Action Casualty [in Part]

When the vessel was torpedoed she settled down almost immediately on the fore part,
settled gradually more and more, and by the time she went down, the after end of the ve
150 feet in the air, and then she went straight down. Testimony by Captain Olof W. Ekstro

Report On US Merchant Tanker War Action Casualty Notes
Submarine was sighted before, during and after attack
Navigation lights were off at time of attack, 0540
Vessel Abandoned 0555 Vessel Sank 0645
Number of lookouts: 2
Number on engineering watch below: 3
Vessel Carried 4 lifeboats and 4 were used to abandon ship
Draft loaded (maximum allowed): 29' 10 1/2 "
Draft when attacked: 29' 10 "

NOAA Office of National Marine Sanctuaries: West Coast Region
Research Provided by Robert Schwemmer
9/23/2009

CARGO

Montebello

Number 221100
Cargo CA Crude Oil 73,570.99 barrel 21.81 gravity**/ 2477 (bunkers)
Deck Load No
Overloaded No
Value 74,674.55
Weight in tons 10,920
Gallons 3,089,982us

COMMENTS

Cargo Heating Coils - 2" -

TANK	Fore Deep	#1 and #2	#3 to #9	Fuel Oil	Total
Lin. Ft.	372	840	4200	440	5852
Sq. Ft.	232	520	2618	274	3644

Main Cargo "Tanks One Side Only" 42Gals =BBL (2% allowed for expansion)

Tanks	Frames	CU.FT.	Gals.	Gals. x2	BBLS	BBLS x 2
No. 9	22-25	24469	183027	366054	4358	8716
No. 8	25-28	24269	181532	363064	4322	8644
No. 7	28-31	24158	180704	361408	4302	8604
No. 6	31-34	24082	180134	360268	4289	8578
No. 5	34-37	24299	181755	363510	4327	8654
No. 4	37-40	24677	184581	369162	4395	8790
No. 3	40-43	25277	189074	378148	4502	9004
No. 2	43-45	16883	126288	252576	3007	6014
No. 1	45-47	16434	122923	245846	2927	5854
Totals		204548	1530018	3060036	36429	72858

Summer Tanks

Frame	BBLS x 2
22-25	1108
25-31	2214
31-37	2214
37-43	2212
43-47	1444
	9192

Main Cargo + Summer Tanks = 82050 BBLS

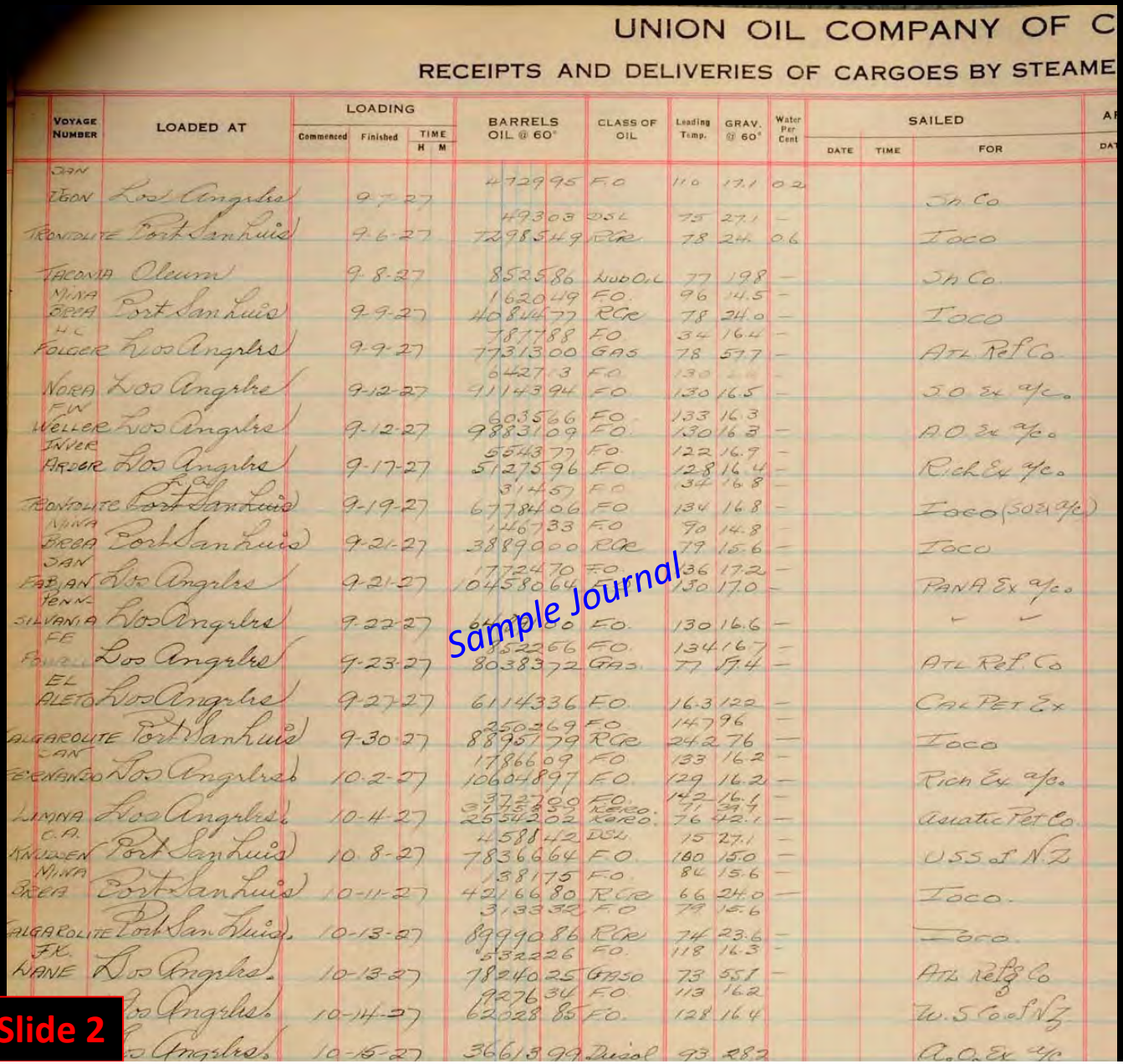
Dry Cargo Space Compartment	Both Sides Frames	Cu. Ft. Gr.	Cu. Ft. Bg.
Cargo Hold No. 3	19-34	57142	55681
Cargo Hold No. 2	34-47	50834	49515
No. 1 Above Deck	47-52	13707	13270
No. 1 Above Main Deck	47-52	13619	13160
No. 1 Above Lower Deck	47-52	12352	11894
Totals		147654	143525

80,000 barrel capacity Average Cargo Loaded 76,500 BBLS
Cargo Average Time Loading 10 hours - Cargo Average Time Discharging 27 hours
Fitted For Fuel Oil 1454 ton capacity
Number of Hatches & Holds: 3 Watertight to Freeboard, 1 Watertight to 2nd Deck, 10 Oil-Tight Long Bulkheads, 1 Hatch 9' 6" x 10', 9 Cargo Tanks 28' 6"
** Northern District Court trial transcript states 73,570.99 barrels CA crude oil of 21.81 gravity

NOAA Office of National Marine Sanctuaries: West Coast Region
* After Vessel Name Indicates "Not A Total Loss"
Research Provided by Robert Schwemmer
9/23/2009

Slide 1

Determine *Montebello*'s oil cargo gravity and quantity



UNION OIL COMPANY OF C

RECEIPTS AND DELIVERIES OF CARGOES BY STEAME

VOYAGE NUMBER	LOADED AT	LOADING Commenced	LOADING Finished	LOADING TIME H M	BARRELS OIL @ 60°	CLASS OF OIL	Loading Temp.	GRAV. @ 60°	Water Per Cent	SAILED DATE	SAILED TIME	SAILED FOR
SAN IGON	Los Angeles		9-7-27		472995	F.O.	110	17.1	0.2			Sin Co
TRONOLITE	Port San Luis		9-6-27		49303	DSL	75	27.1	—			
					7298549	RGR	78	24.	0.6			Ioco
TACOMA	Oleum		9-8-27		852586	HUBOIL	77	19.8	—			Sin Co.
NINA BREA	Port San Luis		9-9-27		162049	F.O.	96	14.5	—			
					4084477	RGR	78	24.0	—			Ioco
H C FOLGER	Los Angeles		9-9-27		787788	F.O.	34	16.4	—			
					7731300	GAS	78	57.7	—			Atl Ref Co.
NORA	Los Angeles		9-12-27		6427.3	F.O.	130					
					4114394	F.O.	130	16.5	—			S.O. Ex a/c.
FW WELLER	Los Angeles		9-12-27		6035766	F.O.	133	16.3				
					9883109	F.O.	130	16.3	—			A.O. Ex a/c.
INVER ARDOR	Los Angeles		9-17-27		5543777	F.O.	122	16.9	—			
					5127596	F.O.	128	16.4	—			Rich Ex a/c.
F&H TRONOLITE	Port San Luis		9-19-27		31457	F.O.	34	16.8	—			
					6778406	F.O.	134	16.8	—			Ioco (50% a/c)
NINA BREA	Port San Luis		9-21-27		1467733	F.O.	90	14.8	—			
					3889000	RGR	79	15.6	—			Ioco
SAN FABIAN	Los Angeles		9-21-27		1772470	F.O.	136	17.2	—			
					10458064	F.O.	130	17.0	—			PANA Ex a/c.
PENN-SILVANIA	Los Angeles		9-22-27		[illegible]	F.O.	130	16.6	—			
FE												
	Los Angeles		9-23-27		8522766	F.O.	134	16.7	—			
					8038372	GAS	77	57.4	—			Atl Ref Co
EL ALETO	Los Angeles		9-27-27		6114336	F.O.	163	122	—			Cal Pet Ex
					250269	F.O.	147	96	—			
ALGAROLITE	Port San Luis		9-30-27		8896179	RGR	24	276	—			Ioco
SAN FERNANDO	Los Angeles		10-2-27		1786609	F.O.	133	16.2	—			
					10604897	F.O.	129	16.2	—			Rich Ex a/c.
LUNINA	Los Angeles		10-4-27		3722799	F.O.	142	16.4	—			
					2554202	KERO.	71	39.7	—			Asiatic Pet Co.
C.A. KNUDSEN	Port San Luis		10-8-27		458442	DSL	76	42.1	—			
					7836664	F.O.	15	27.1	—			
NINA BREA	Port San Luis		10-11-27		38175	F.O.	100	15.0	—			USS of N.Z.
					4216680	RGR	84	15.6	—			
					313332	F.O.	66	24.0	—			Ioco.
ALGAROLITE	Port San Luis		10-13-27		8999086	RGR	79	15.6				
FK. WANE	Los Angeles		10-13-27		532226	F.O.	74	23.6	—			Ioco.
					7824025	GASO	118	16.3	—			
					9276 34	F.O.	73	551	—			Atl Refg Co
	Los Angeles		10-14-27		6202886	F.O.	113	16.2				
							128	16.4				Tw. S Co. of N.Z.
	Los Angeles		10-15-27		3661399	Diesel	93	28.2				A.O. Ex a/c

Sample Journal

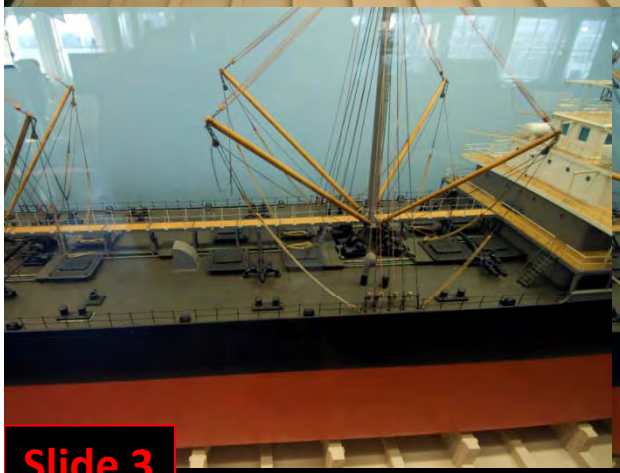
California Crude Oil
73,570.99 barrels
21.81 gravity

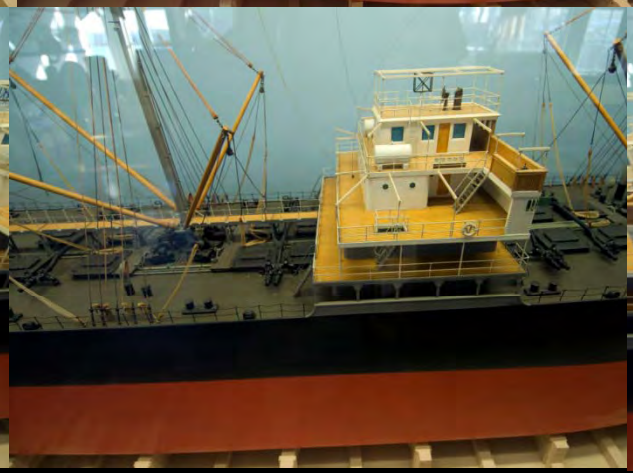
Northern District court trial transcript

Slide 2

Montebello model Maritime Museum of San Diego

Note: some details not consistent with historic images/site investigation





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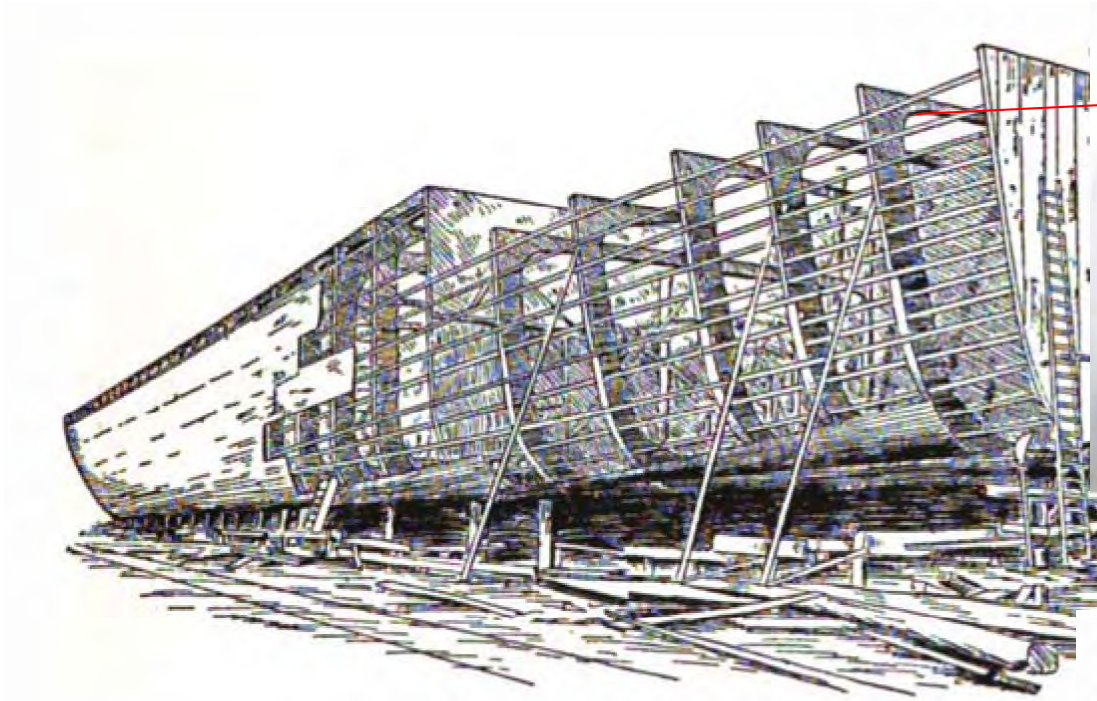

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FIG. 18.— LONGITUDINAL SYSTEM

Isherwood system, emphasis is placed on the longitudinal members of the hull. Main frames run fore-and-aft, and transverse frames are at greater intervals. Transverse frames & beams are widely spaced about 12 feet. Method well-adapted to oil tankers.

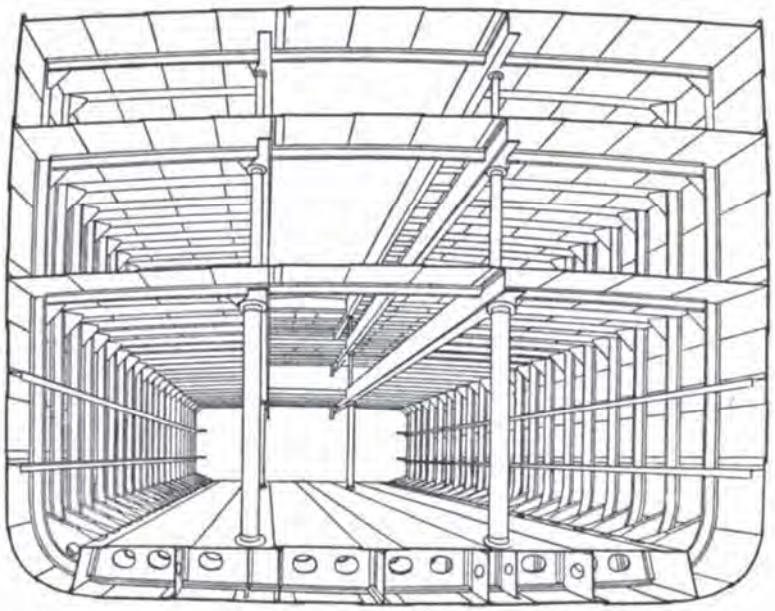

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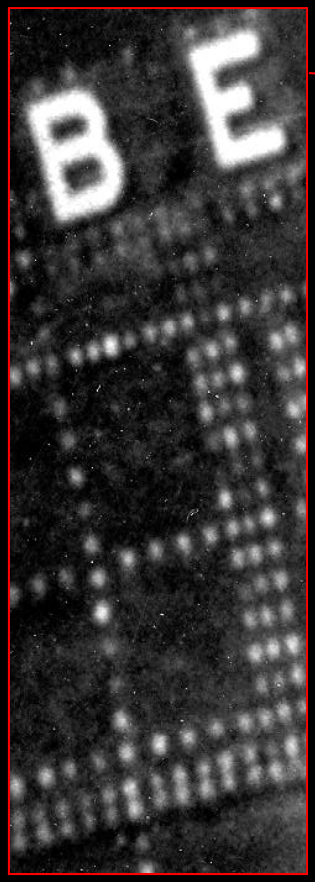
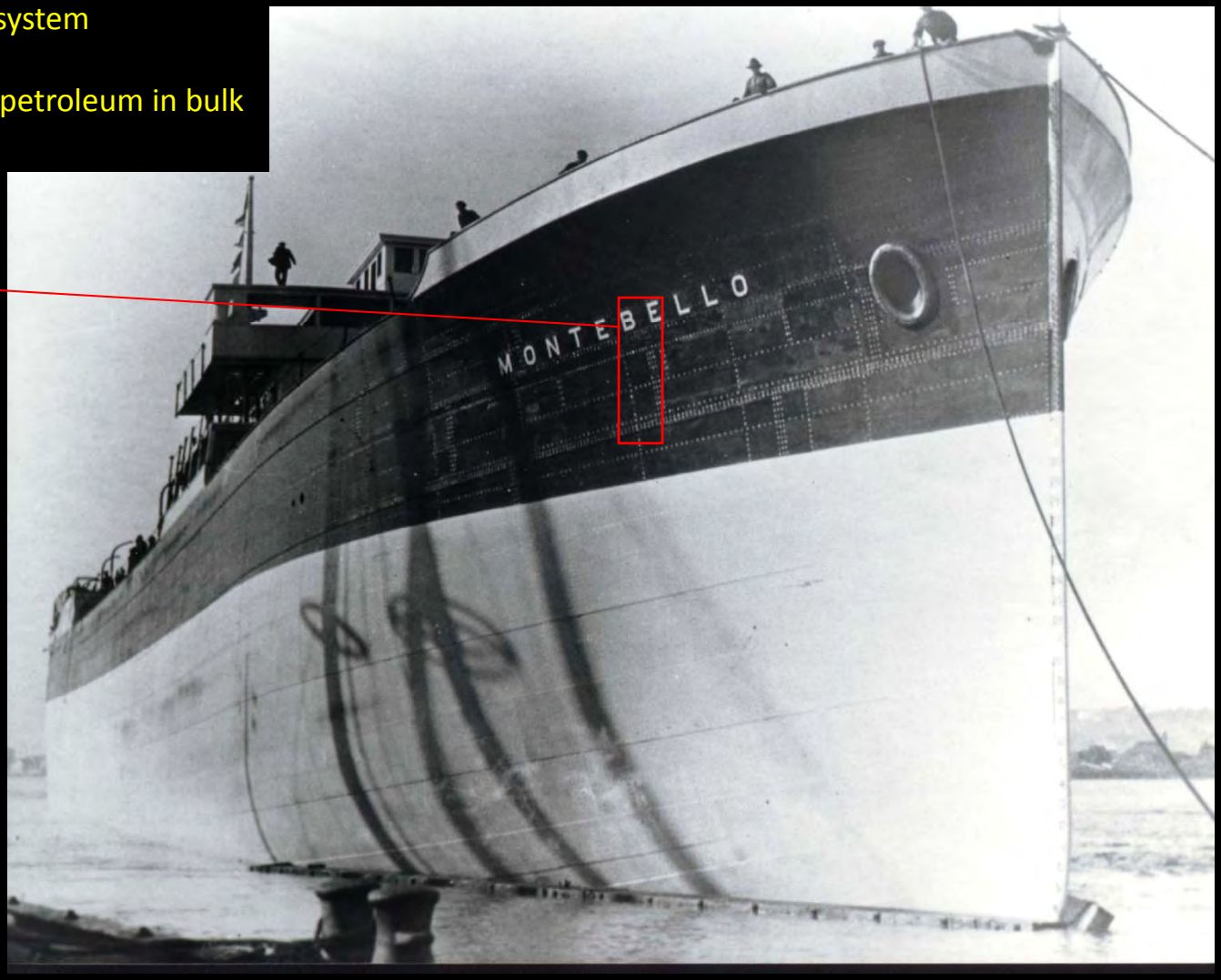
FIG. 19.— TRANSVERSE SYSTEM

Merchant Vessels
Robert Riegel 1921

Slide 4

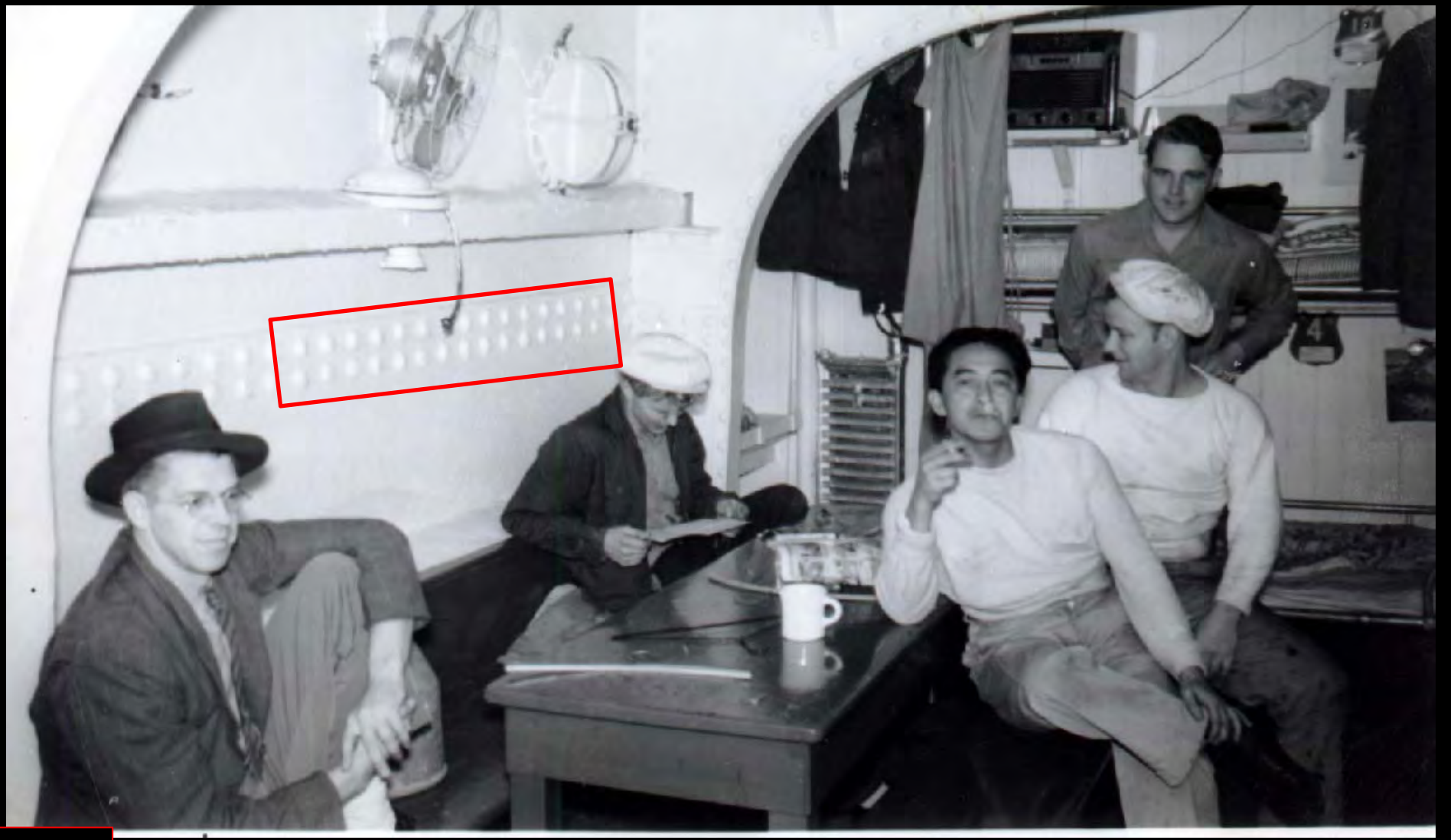
Shelter Deck Tanker
Built on Isherwood longitudinal system
Class: American Bureau A.I (E)
Highest Class for vessel carrying petroleum in bulk





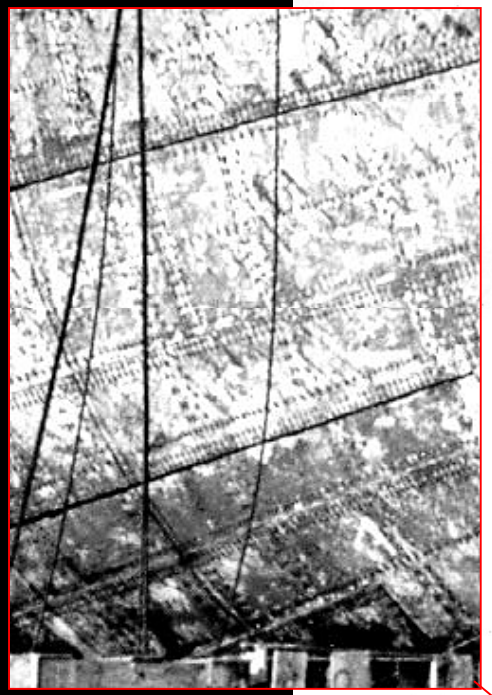
Steel riveted hull above waterline

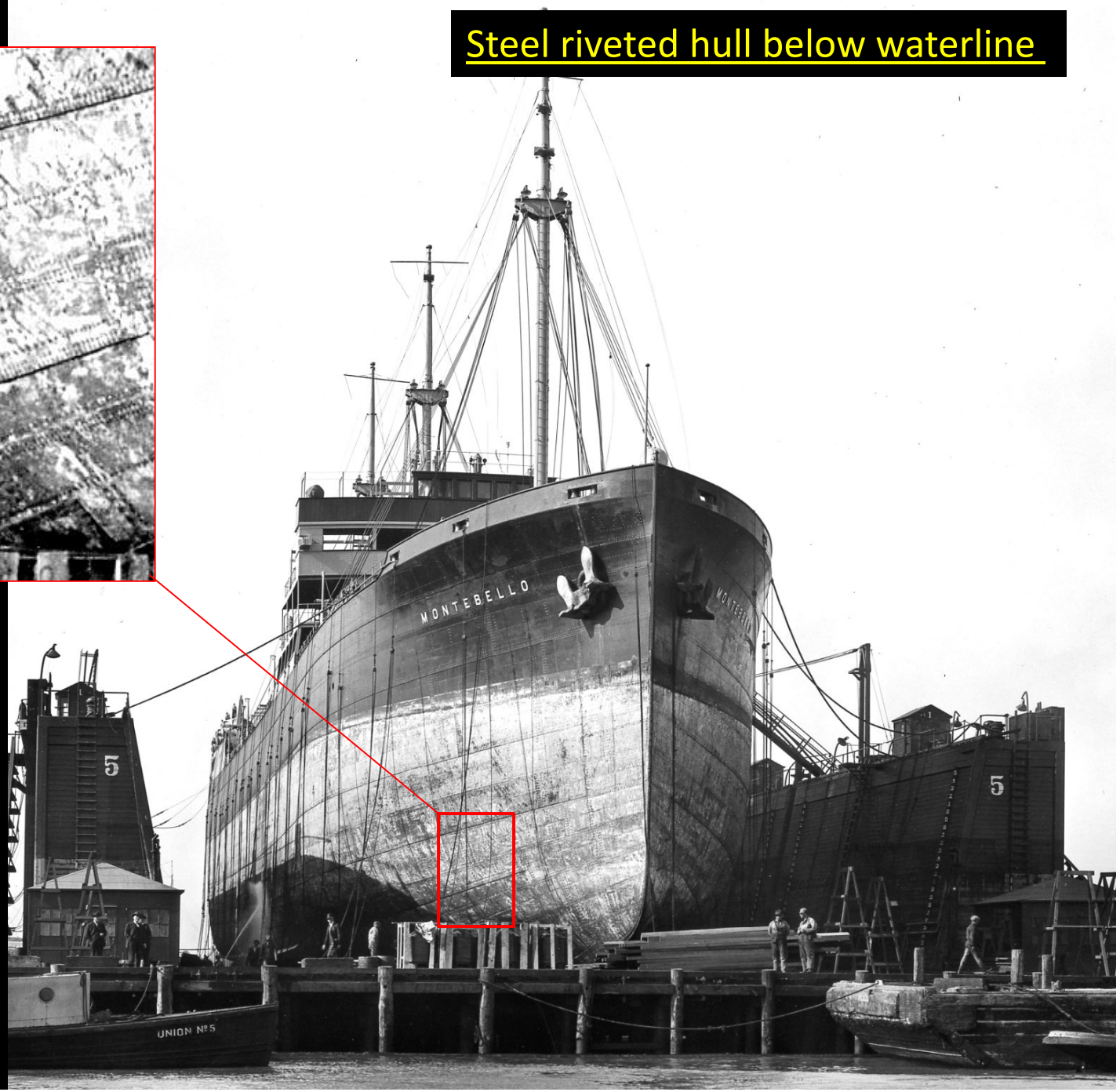
Slide 5



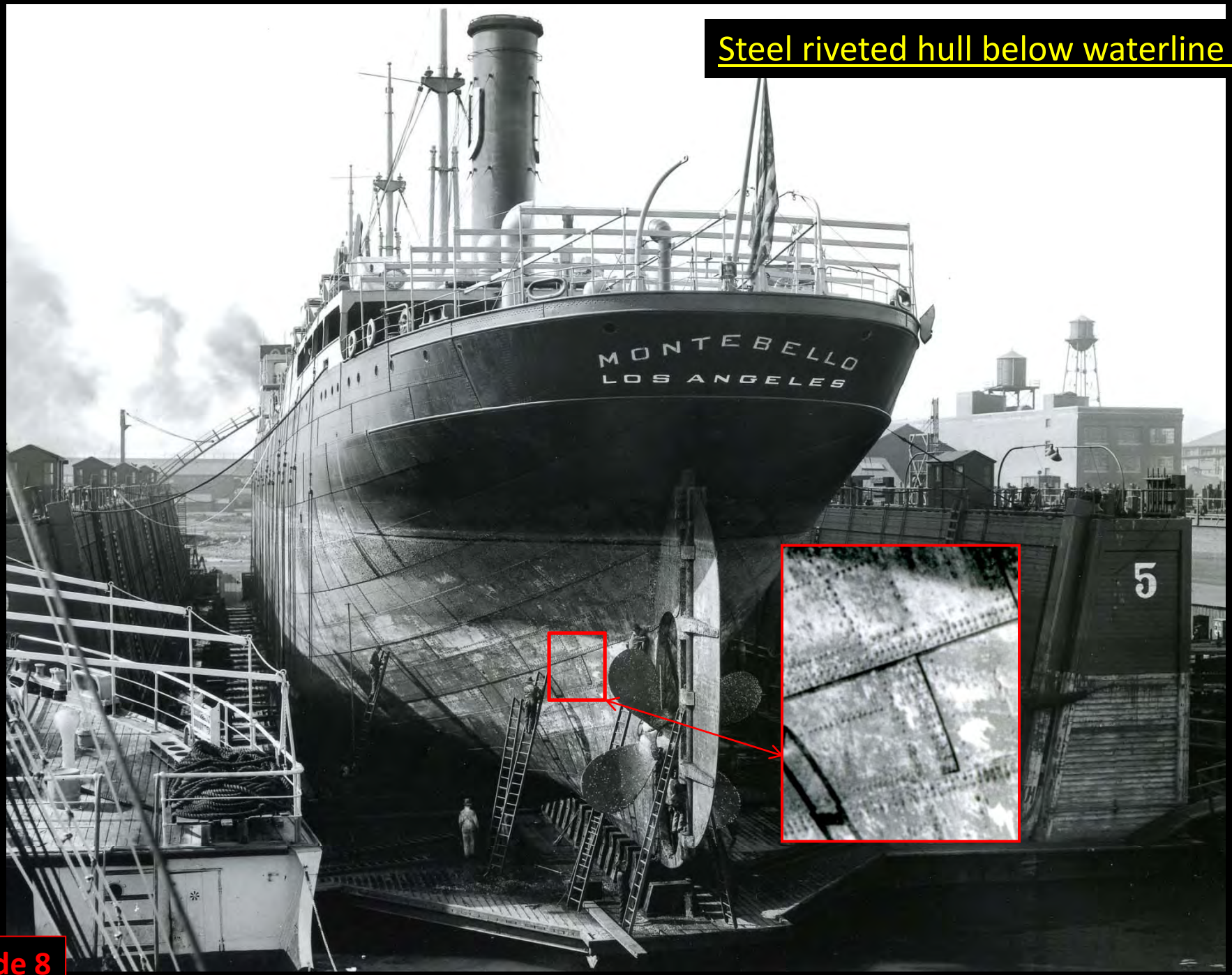
Slide 6

Steel riveted hull below waterline





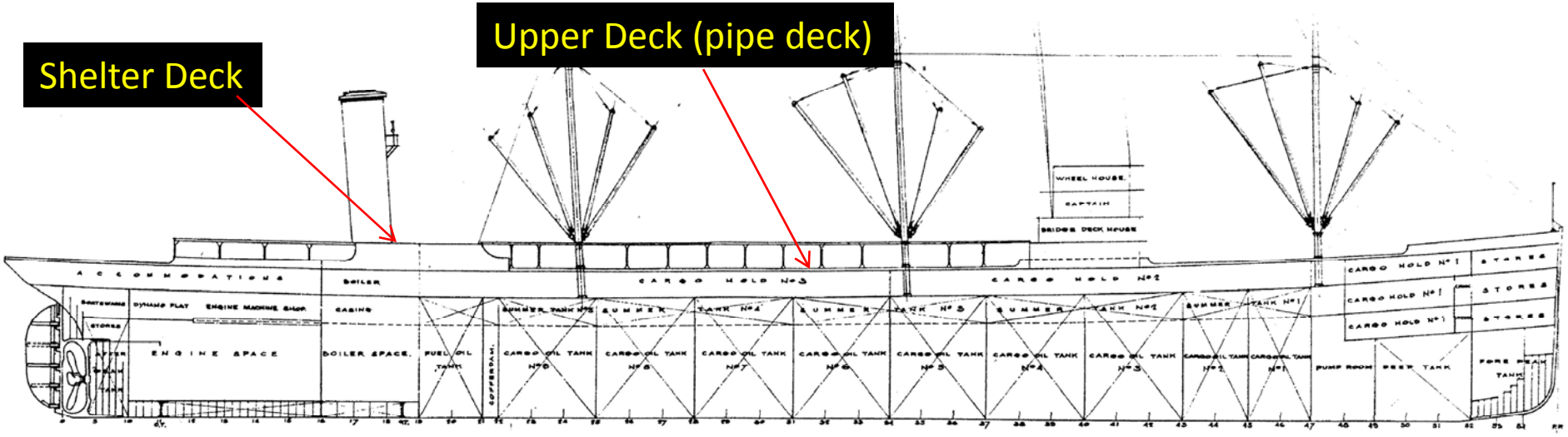
Slide 7


Steel riveted hull below waterline
MONTEBELLO
LOS ANGELES
5

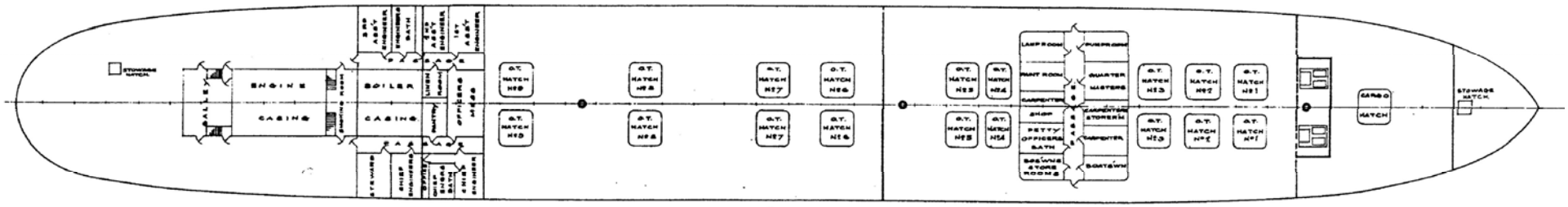
Slide 8

Shelter Deck

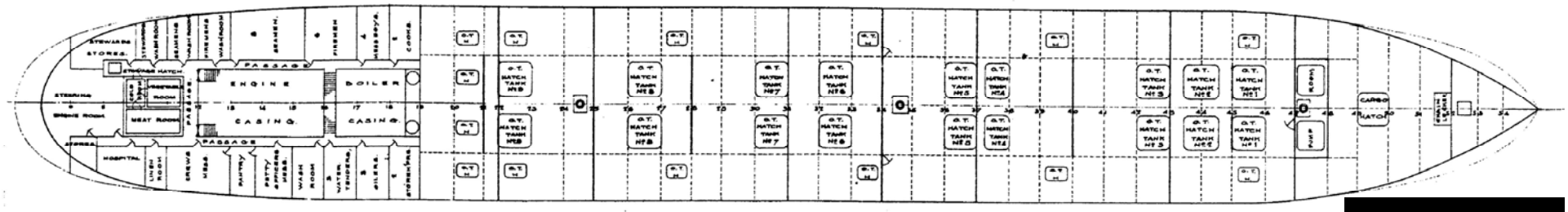
Upper Deck (pipe deck)



Inboard Profile



Shelter Deck

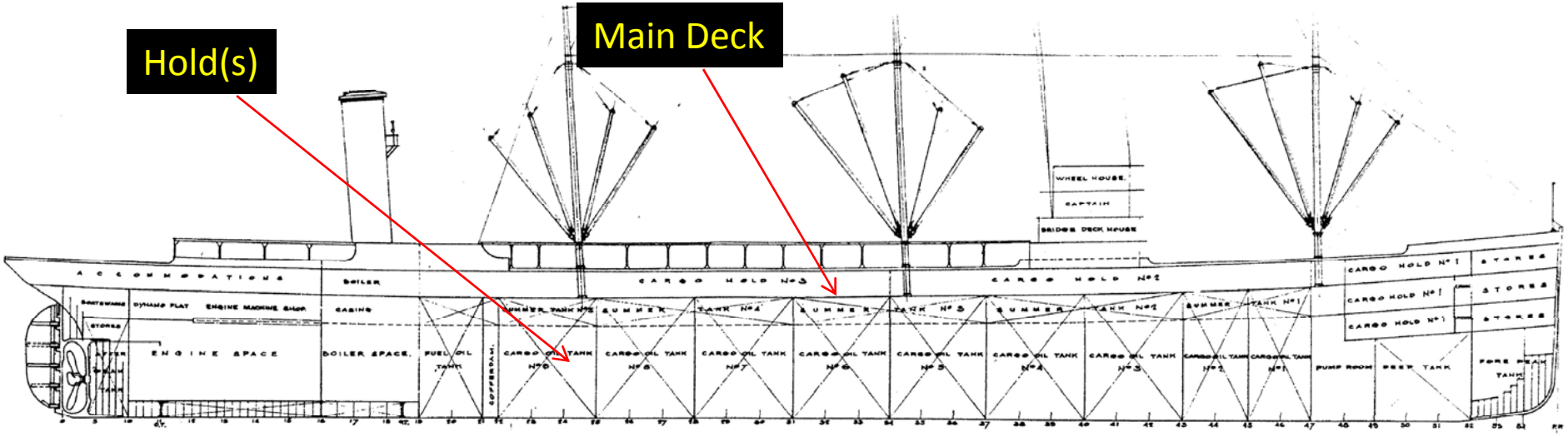


Upper Deck

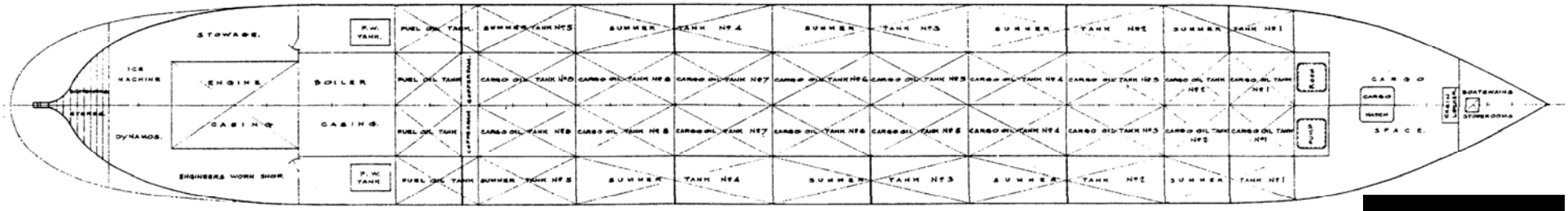
Slide 9

Hold(s)

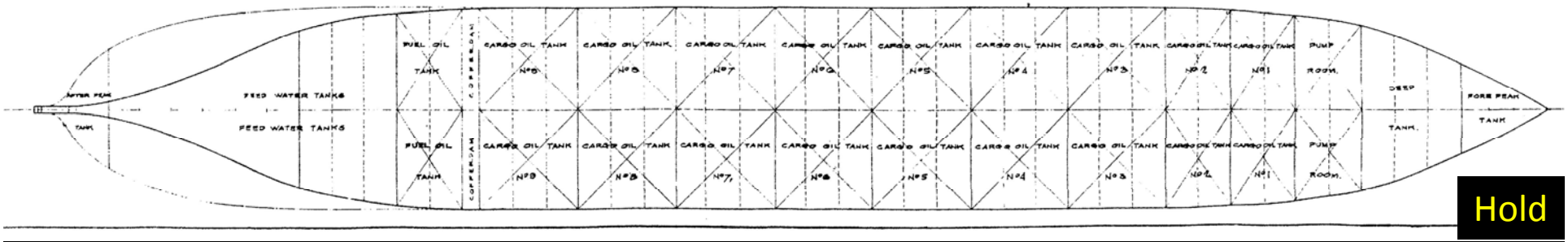
Main Deck



Inboard Profile

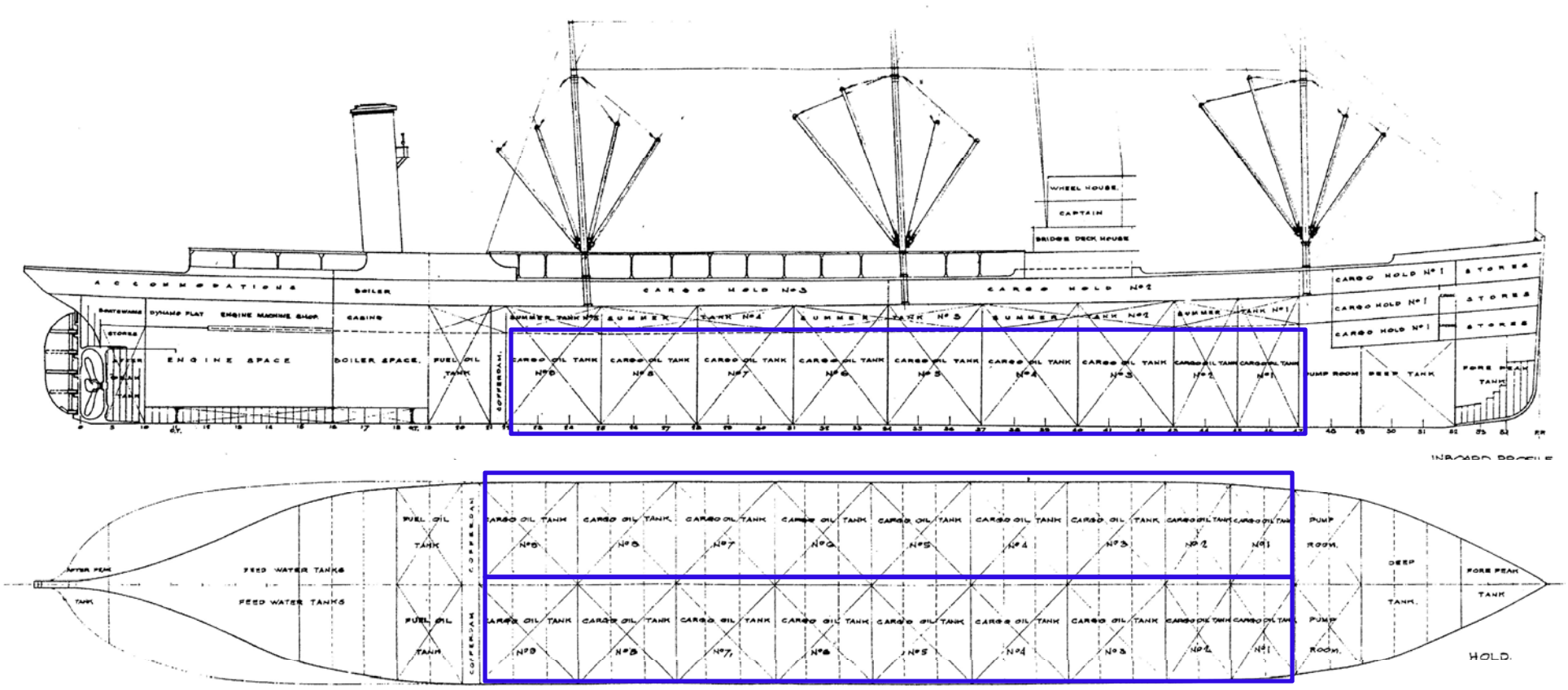


Main Deck



Hold

Slide 10



Main Cargo "Tanks One Side Only" 42Gals =BBL (2% allowed for expansion) Summer Tanks

Tanks	Frames	CU.FT.	Gals.	Gals. x2	BBLS	BBLS x 2	Frame	BBLS x 2
No. 9	22-25	24469	183027	366054	4358	8716		
No. 8	25-28	24269	181532	363064	4322	8644		
No. 7	28-31	24158	180704	361408	4302	8604		
No. 6	31-34	24082	180134	360268	4289	8578		
No. 5	34-37	24299	181755	363510	4327	8654	22-25	1108
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No. 1	45-47	16434	122923	245846	2927	5854	43-47	1444
Totals		204548	1530018	3060036	36429	72858		9192

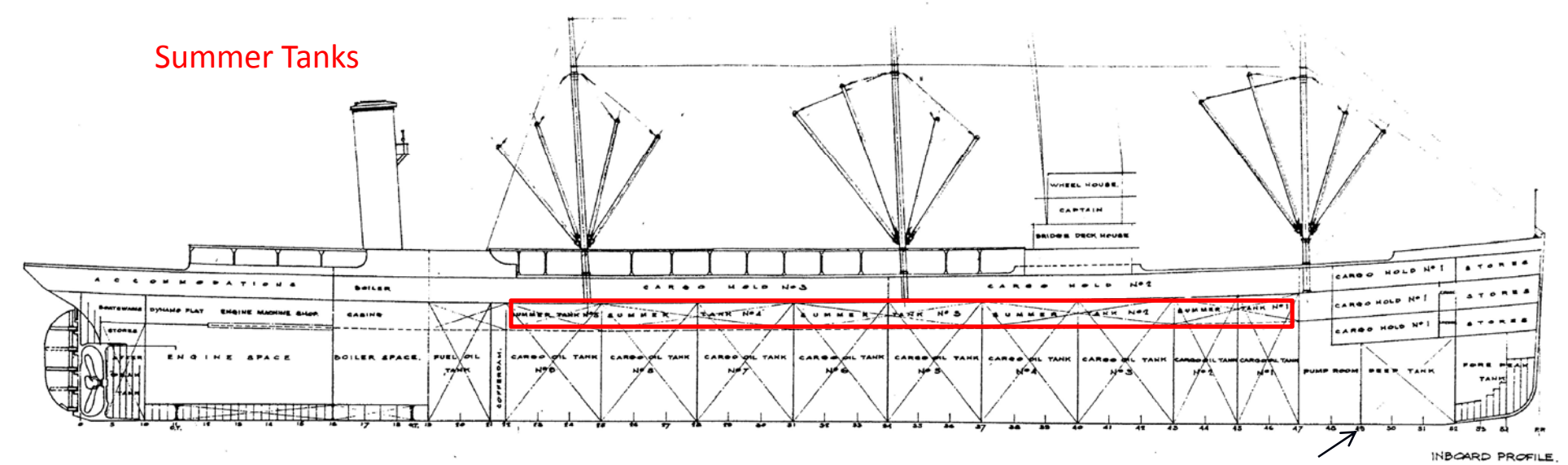
Main Cargo + Summer Tanks = 82050 BBLS_

California Crude Oil
73,570.99 barrels
21.81 gravity *

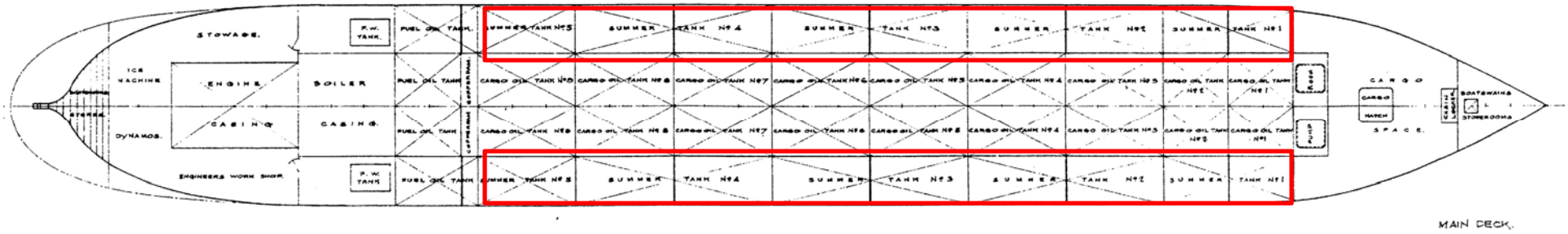
**Northern District court trial transcript*

Slide 11

Summer Tanks



INBOARD PROFILE.

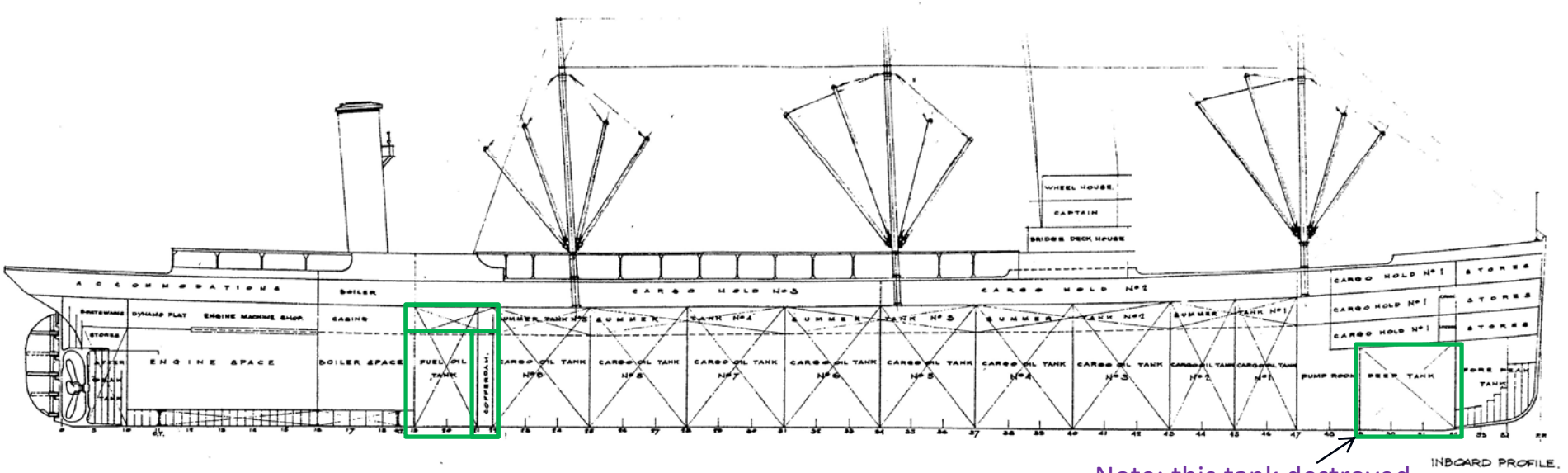


MAIN DECK.

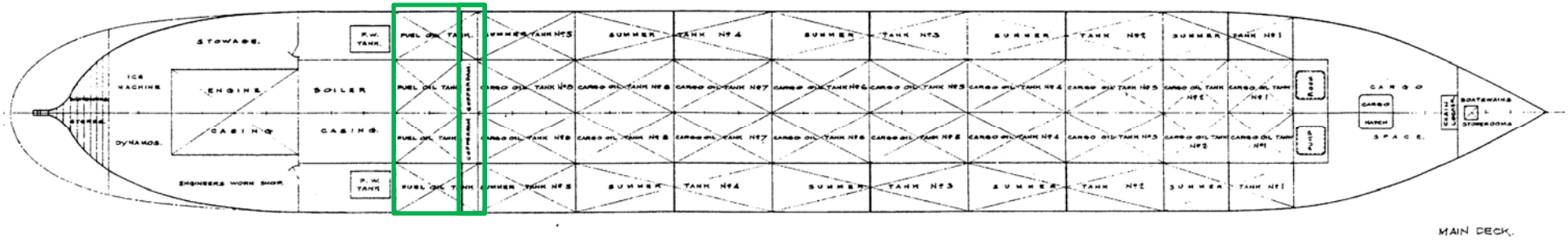
Summer Tanks	
Frame	BBLS x 2
22-25	1108
25-31	2214
31-37	2214
37-43	2212
43-47	1444
Totals	9192

Main Cargo + Summer Tanks = 82050 BBLS_

Slide 12



Note: this tank destroyed torpedo impact zone



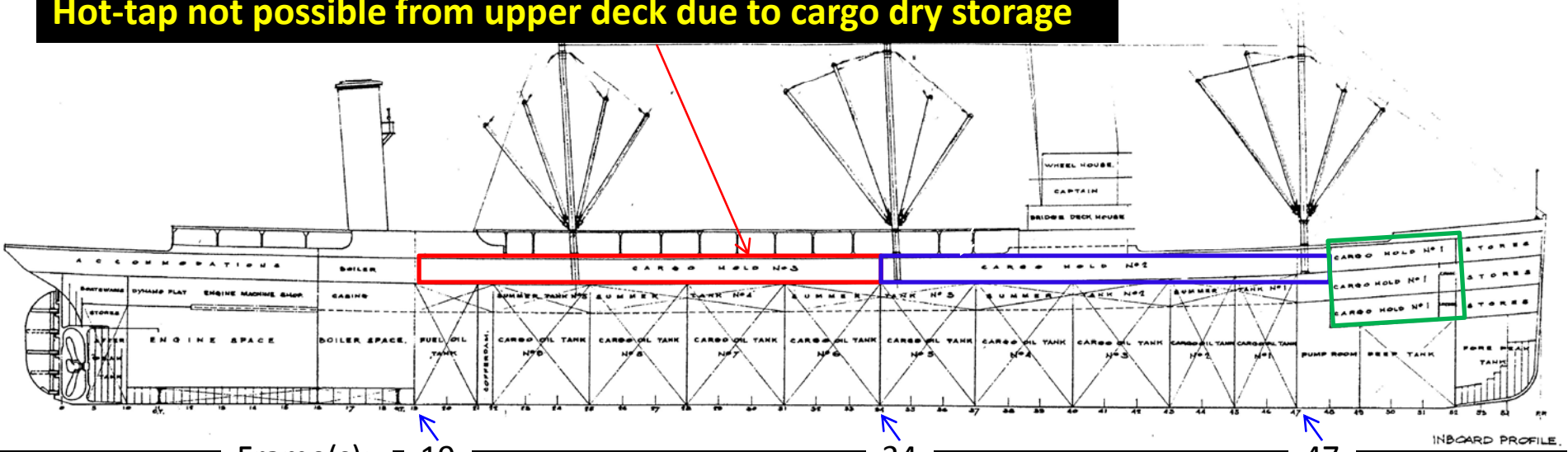
2477 Barrels Bunker Fuel

Tanks Available for Fuel Oil

Tanks	Frames	CU.FT.	Gals.	BBLS	One Side	Both Sides
Fuel Oil	19-21	16426	122871	2925	430	860
Summer	19-22	2587	19351	461	68	136
Coffer Dam	21-22	4095	30629	729	107	214
Deep Tank	49-52	8242	61649	1468	216	432
Totals		31350	234500	5583	821	1642

Slide 13

Hot-tap not possible from upper deck due to cargo dry storage



Frame(s): 19 34 47

Dry Cargo Space Compartment	Frames	Both Sides Cu. Ft. Gr.	Cu. Ft. BA.
Cargo Hold No. 3	19-34	57142	55681
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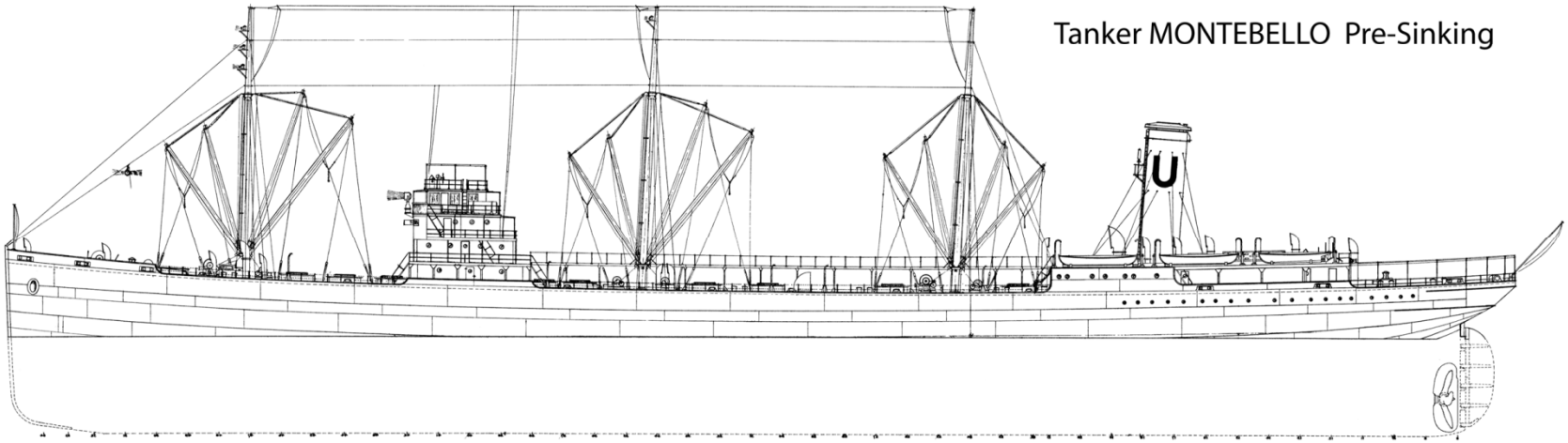
No. 1 Above Main Deck	47-52	13619	13160
No. 1 Above Lower Deck	47-52	12352	11894
Totals		147654	143525

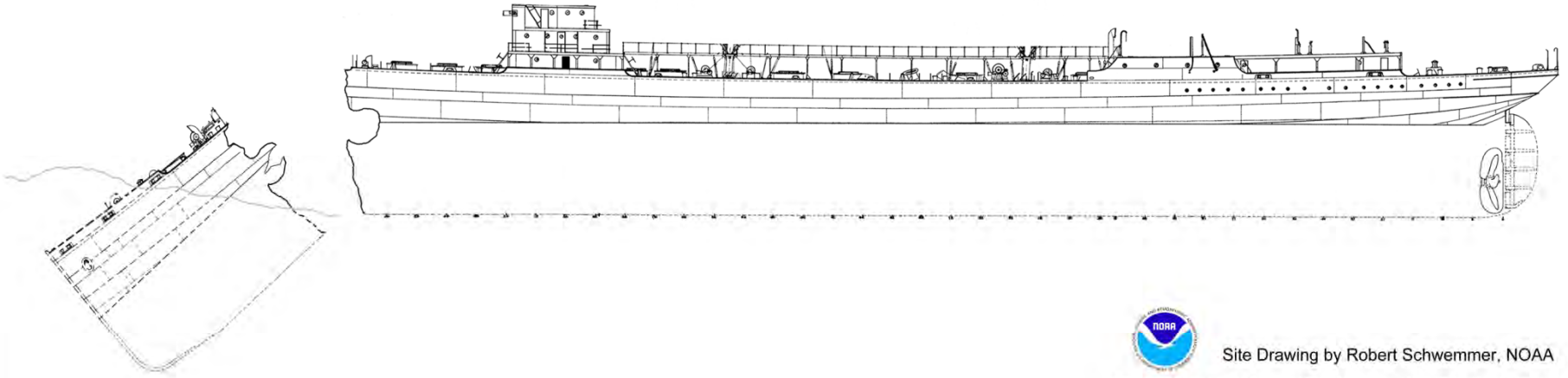
- Locate the American Bureau of Shipping 1920 Rules of Shipping for Construction and Classification of Vessels (*Montebello* Class: American Bureau A.I (E)

- Continue search for construction plans for *Montebello* or sister ship *La Placentia*

Tanker MONTEBELLO Pre-Sinking



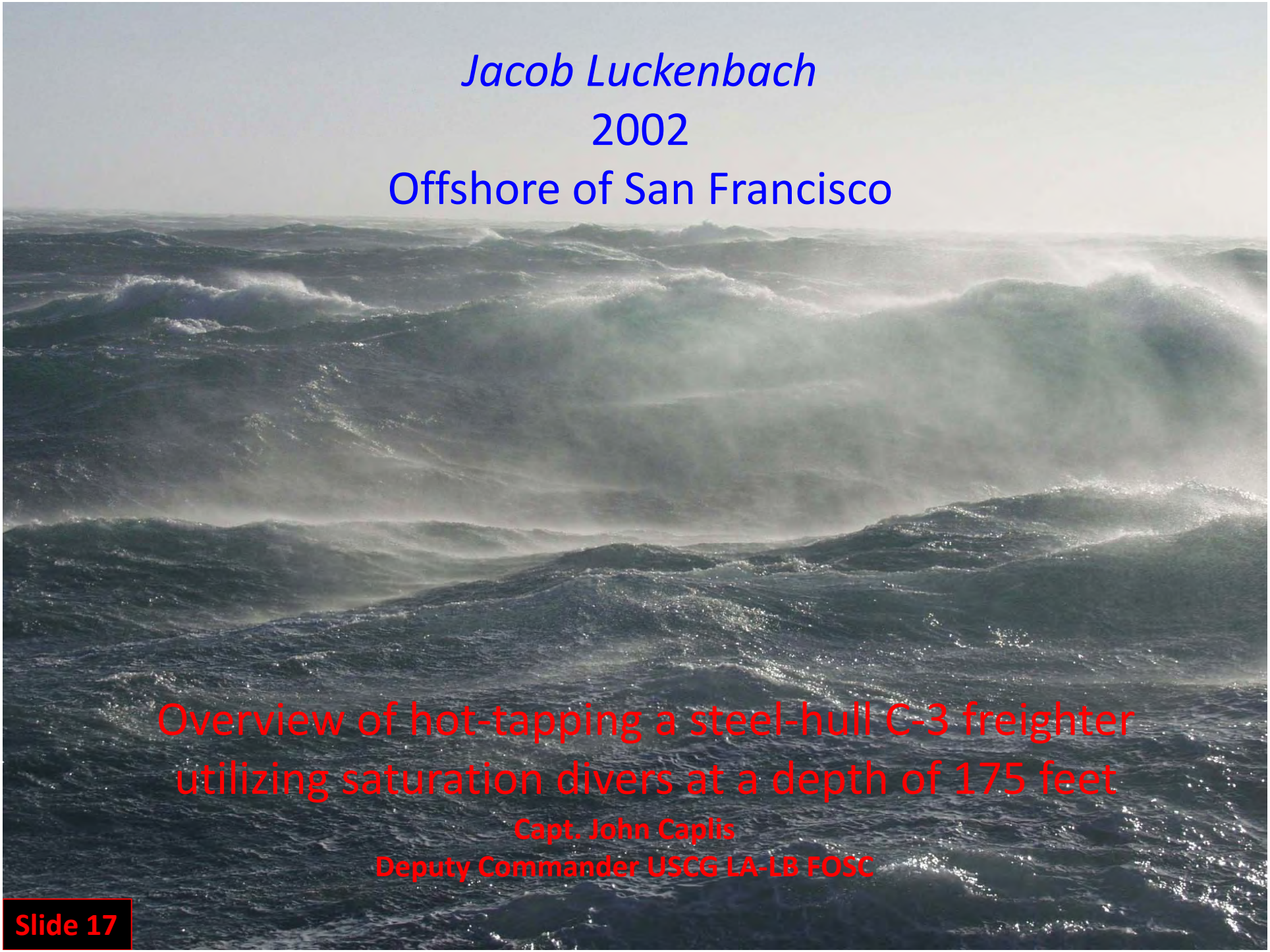
Tanker MONTEBELLO Underwater 2003



Site Drawing by Robert Schwemmer, NOAA

Office of National Marine Sanctuaries – West Coast Region

Slide 16



Jacob Luckenbach

2002

Offshore of San Francisco

Overview of hot-tapping a steel-hull C-3 freighter utilizing saturation divers at a depth of 175 feet

Capt. John Caplis

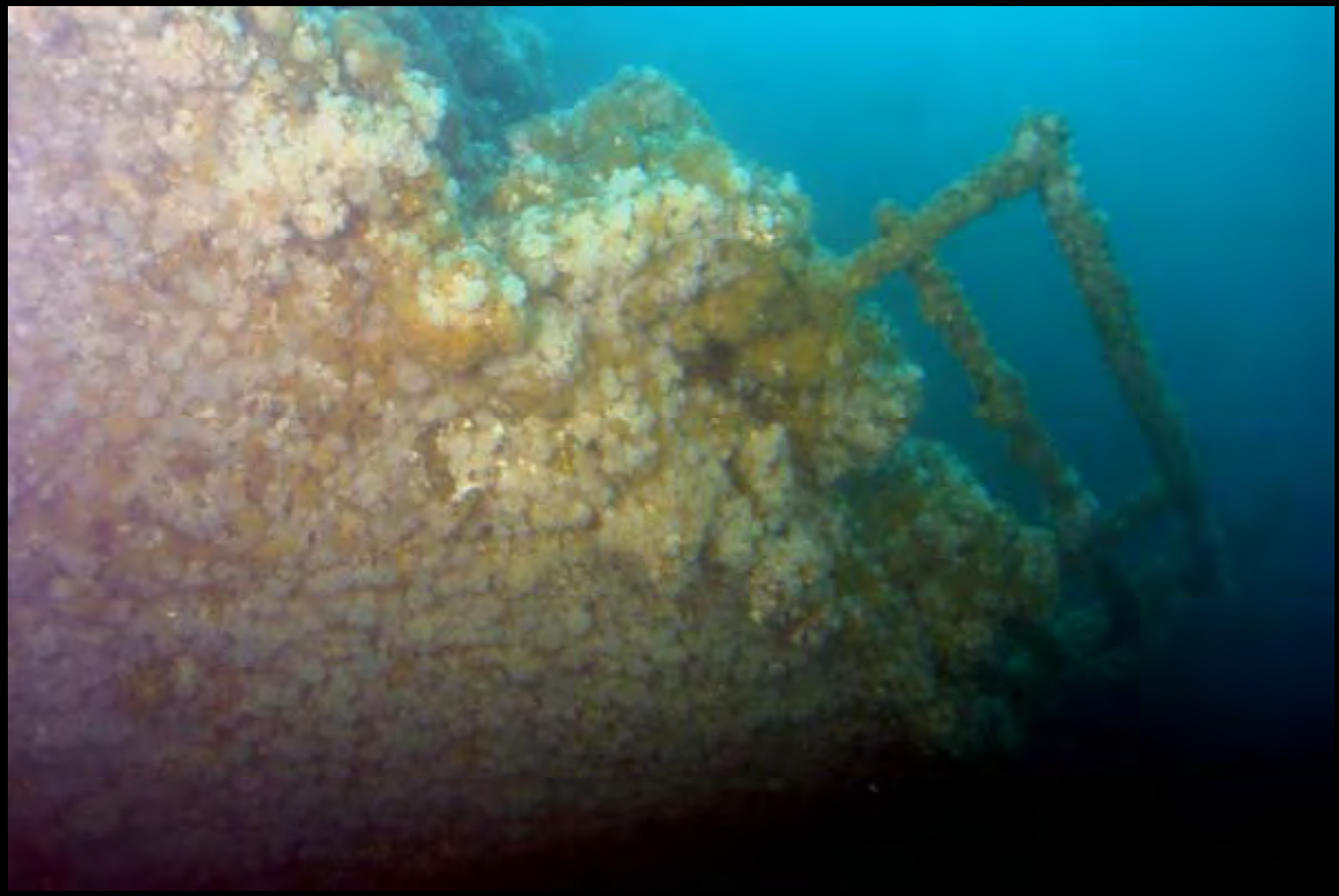
Deputy Commander USCG LA-LB FOSC

3D Sonar Map

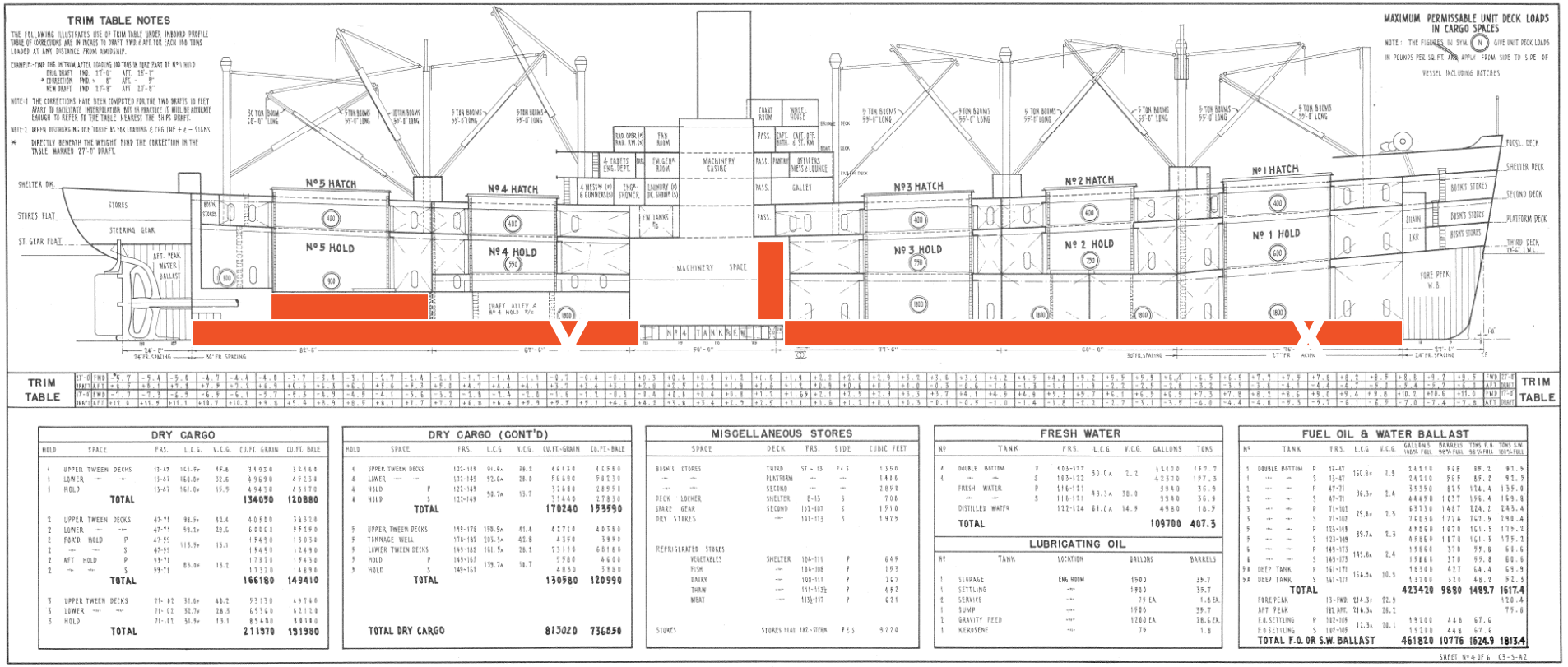
Bow

Deckhouse

Stern



Heavy Marine Life Growth Covered Wreck

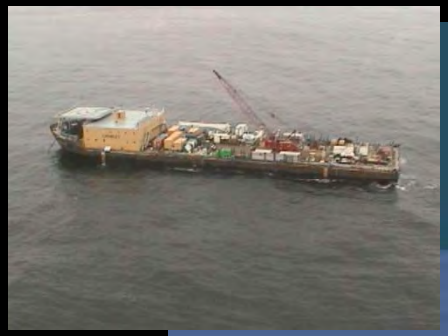


PROFILE OF THE SS *JACOB LUCKENBACH*

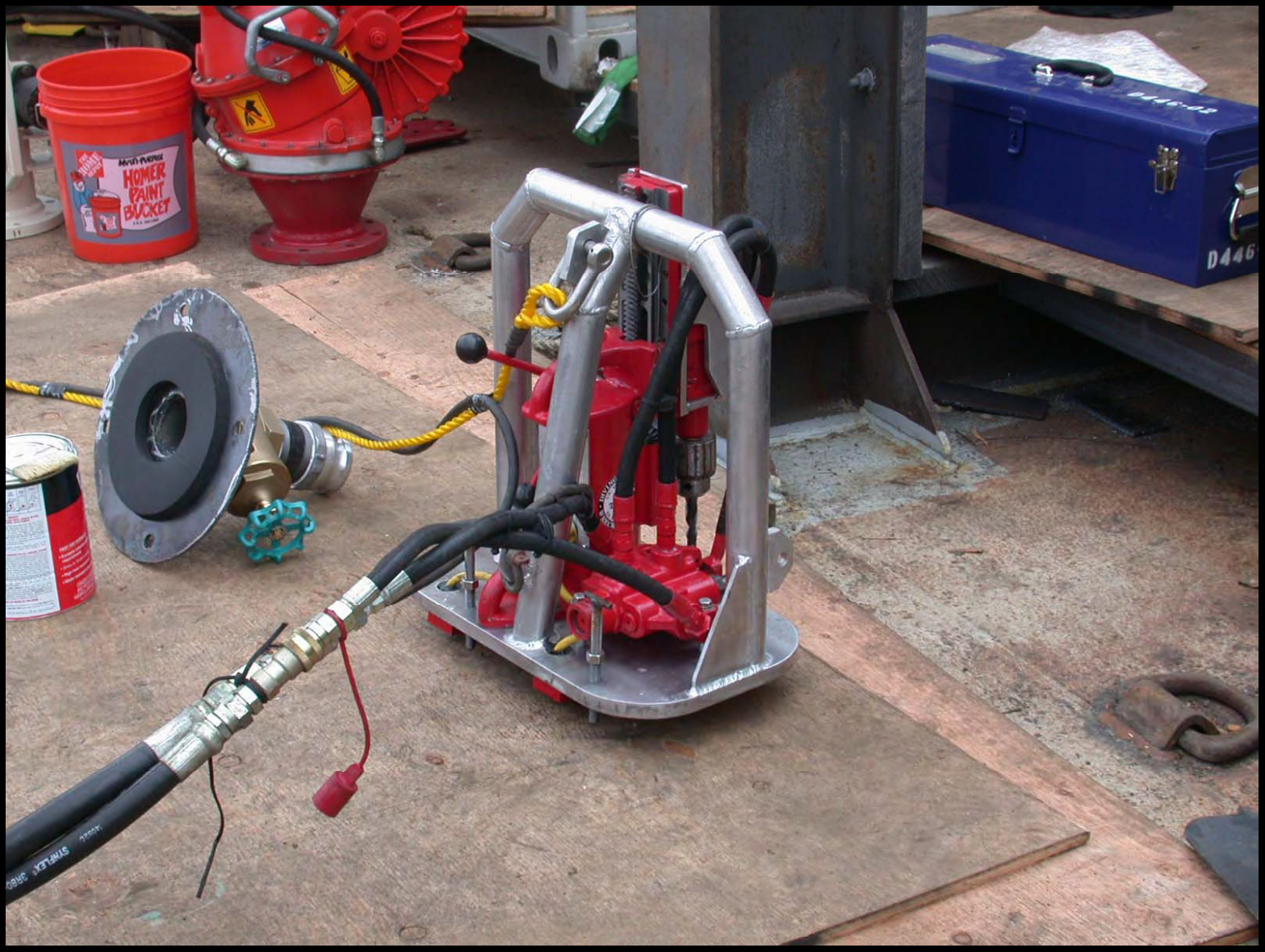
X = No Oil Expected

BUNKER OIL TANKS

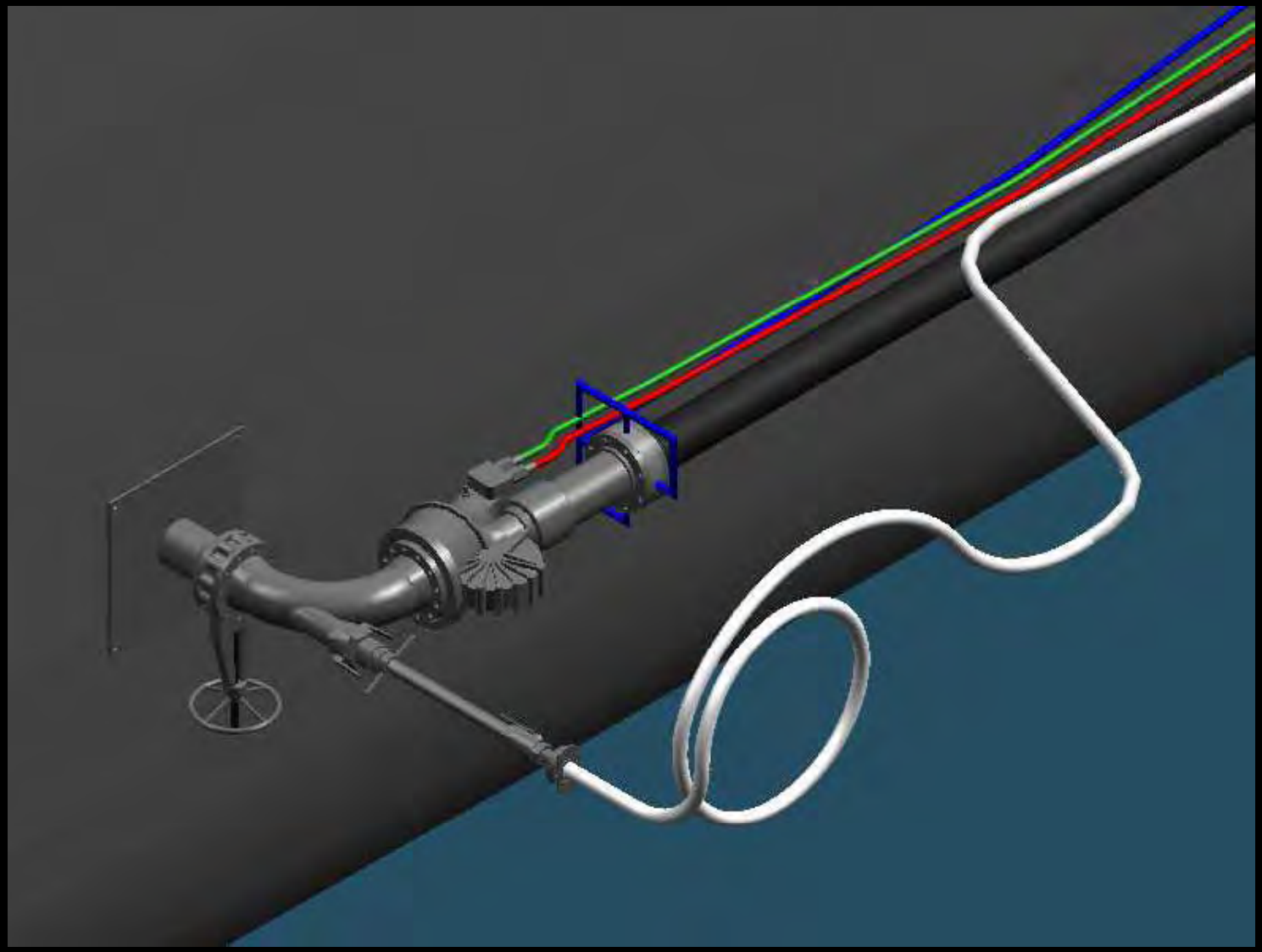
Slide 20



BASIC CONCEPT FOR WORK, 400 FOOT BARGE WORK PLATFORM MOORED OVER THE LUCKENBACH

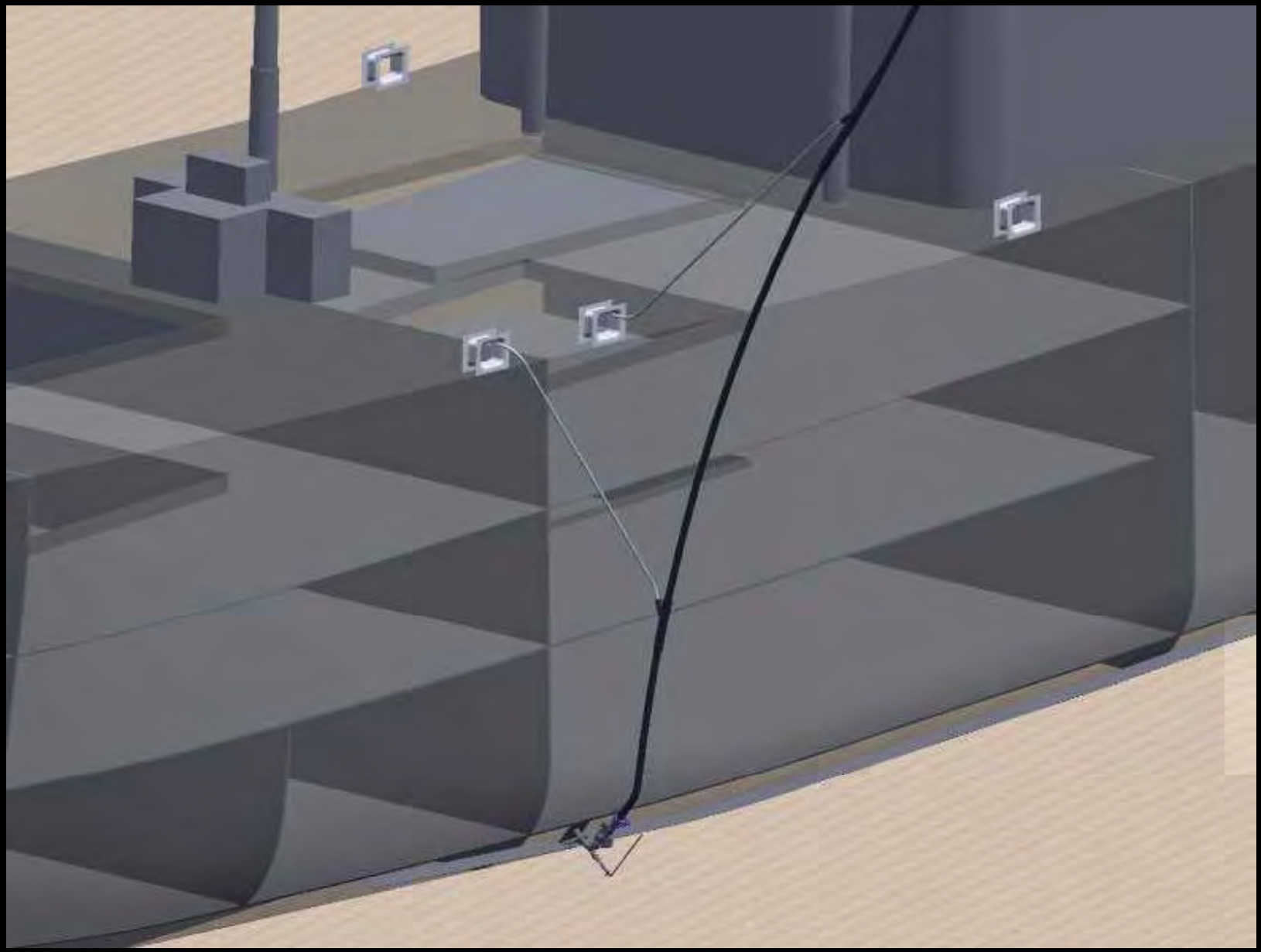


Titan Mag Drill with Small Landing Plate in Background



LANDING PLATE, VALVE, STEAM INJECTION AND PUMP

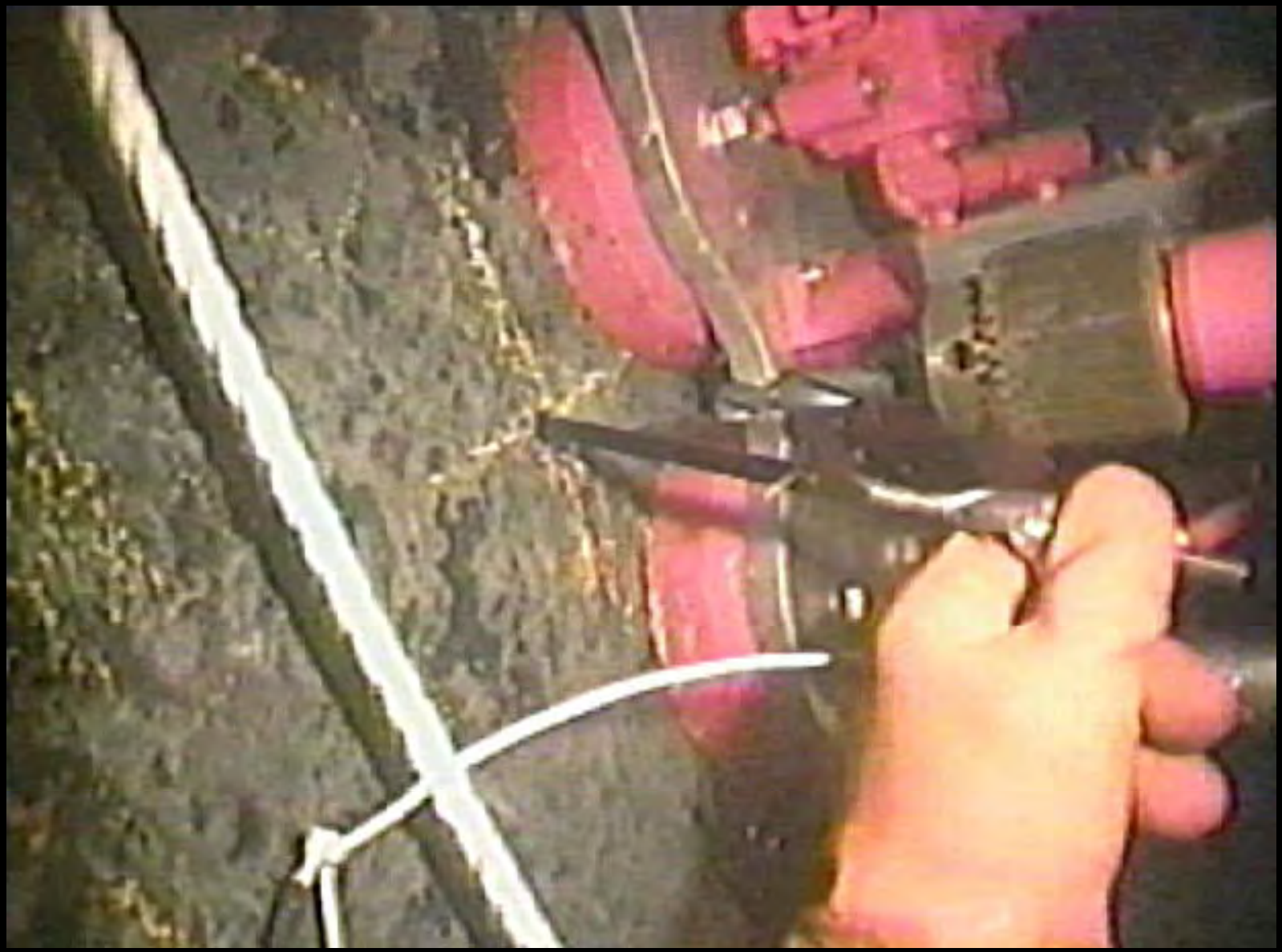
THE REAL THING, VOPS SYSTEM PUMP ARRANGEMENT



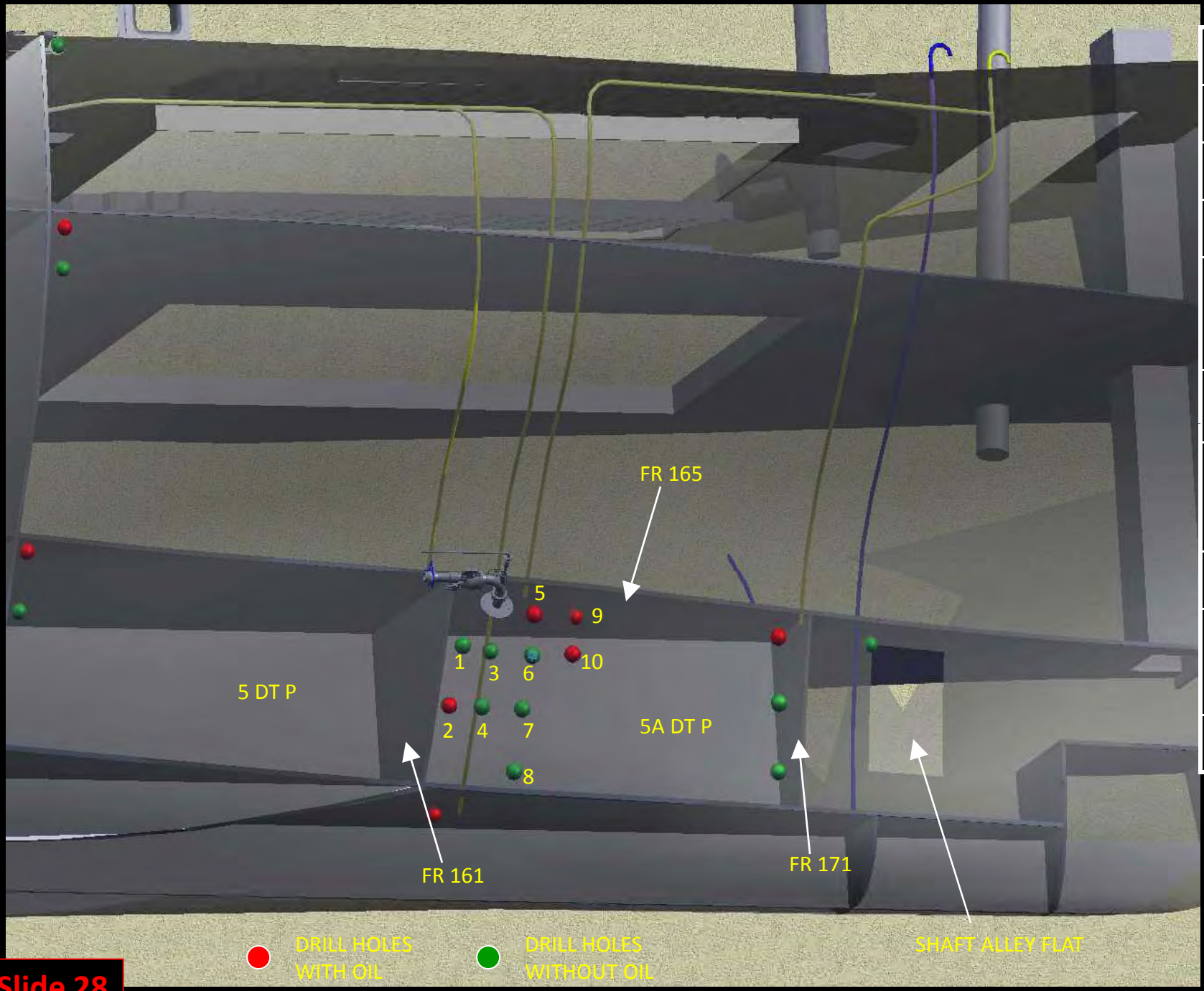
SCHEMATIC, PUMP AND HOSE TO SURFACE

THE OIL'S VIEW OF STEAM INJECTION LANCE

TUBE TYPE HEAT EXCHANGER



SAMPLING A TANK AFTER DRILL/TAPPING



1	48 deg.
2	44 deg
3	100 deg
4	46 deg
5	68 deg 84 deg @ 1400 (second. Steam)
6	80 deg (second. Steam)
7	50 deg (water with oil) (second. Steam)
8	42 deg
9	60 deg (oil @ 6ft, water all the way in)
10	49 deg

DRAWING DATE: 6/26/02

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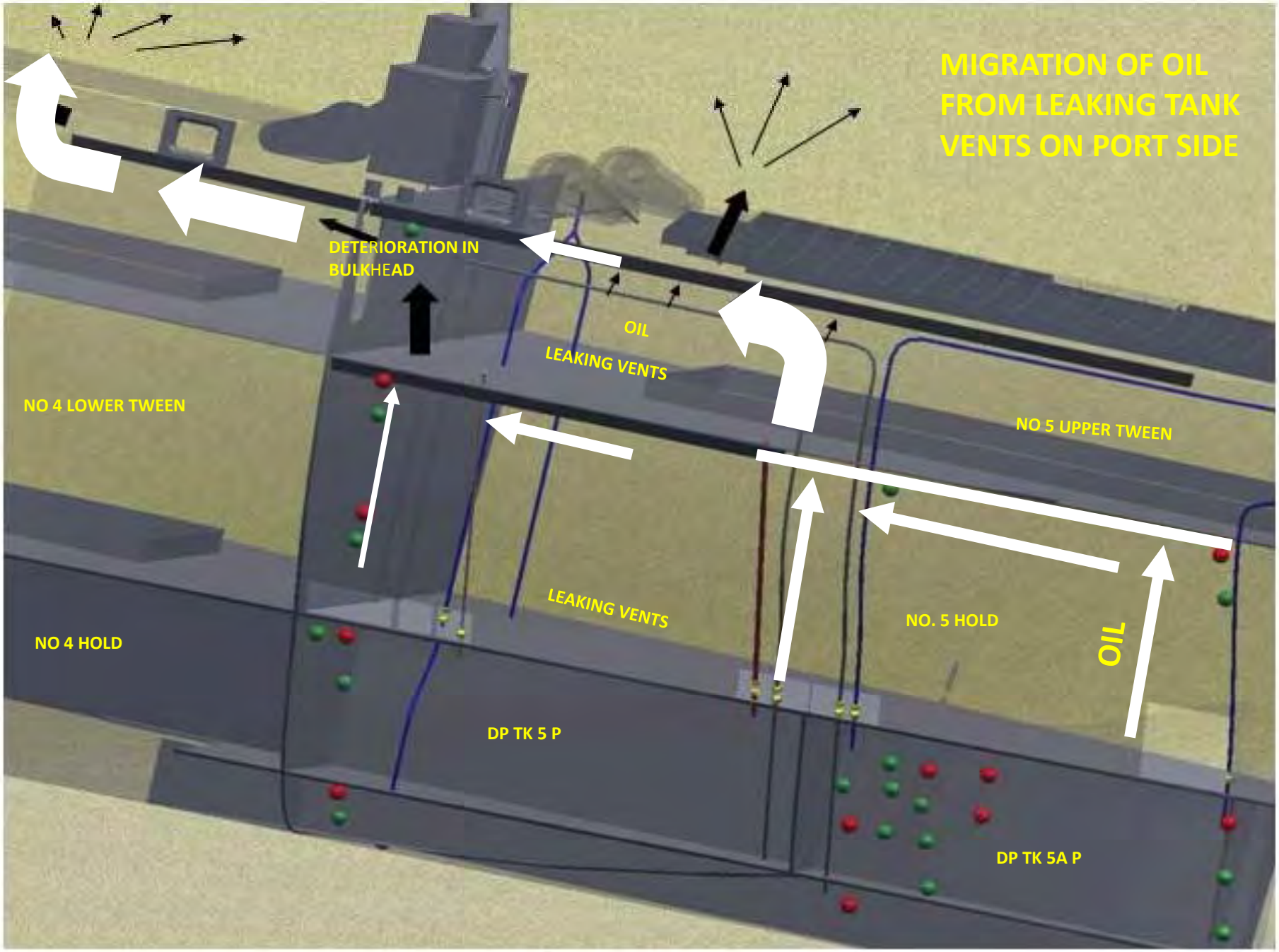
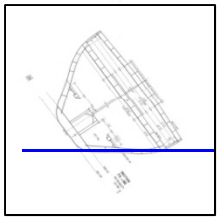

MIGRATION OF OIL FROM LEAKING TANK VENTS ON PORT SIDE
DETERIORATION IN BULKHEAD
OIL
LEAKING VENTS
NO 4 LOWER TWEEN
NO 5 UPPER TWEEN
LEAKING VENTS
NO. 5 HOLD
OIL
NO 4 HOLD
DP TK 5 P
DP TK 5A P

DETERIORATED TANK VENT

STERN SECTION SCHEMATIC – FUEL OIL TANK VENTS AND SOUNDING TUBES



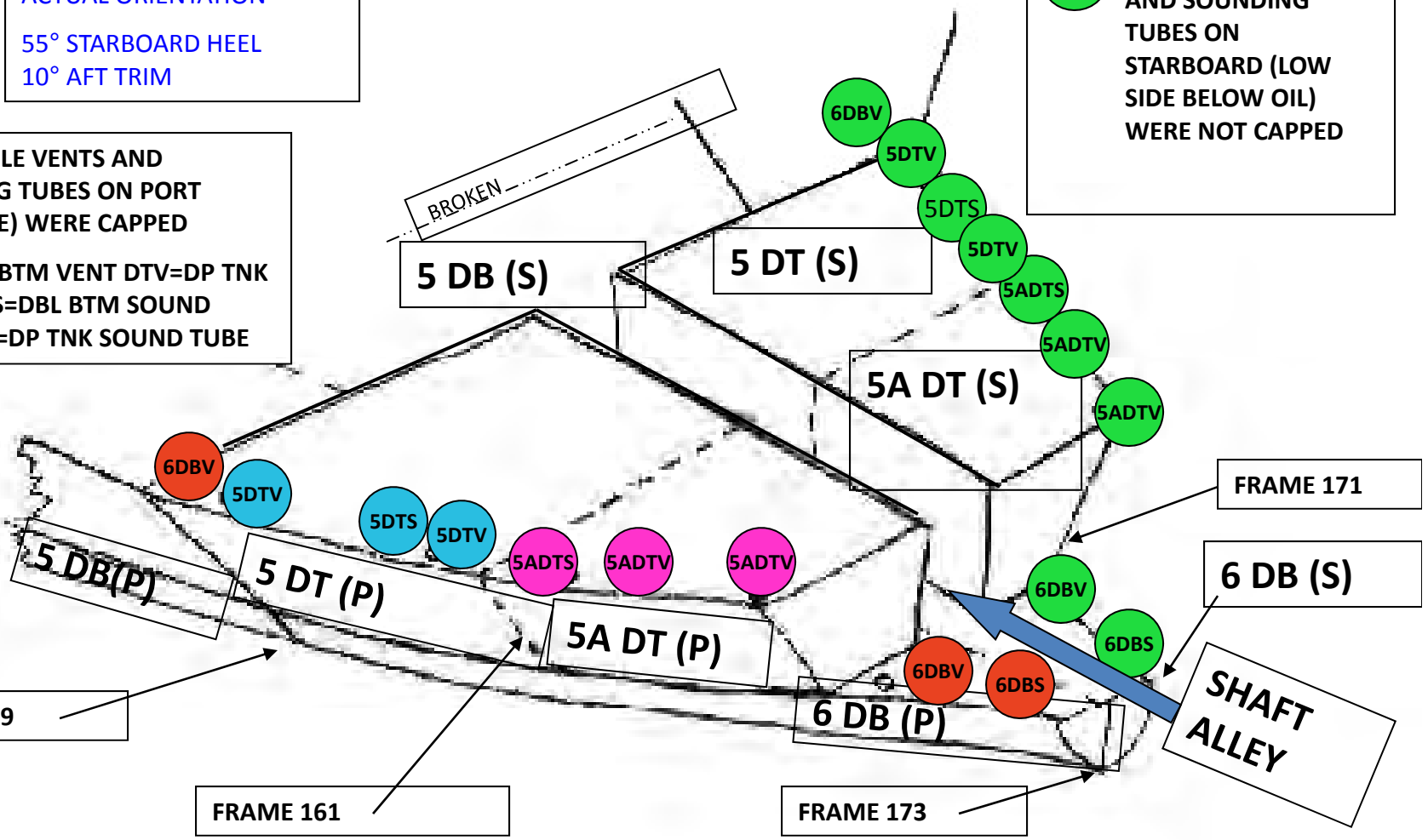
ACTUAL ORIENTATION

55° STARBOARD HEEL
10° AFT TRIM

ACCESSABLE VENTS AND SOUNDING TUBES ON PORT (HIGH SIDE) WERE CAPPED

DBV=DBL BTM VENT DTV=DP TNK VENT DBS=DBL BTM SOUND TUBE DTS=DP TNK SOUND TUBE

INACCESSABLE VENTS AND SOUNDING TUBES ON STARBOARD (LOW SIDE BELOW OIL) WERE NOT CAPPED



MAXIMUM SHELL PLATE WASTAGE AT SHELTER DECK 44% - CURRENT MINIMUM THICKNESS 0.330 INCHES
MAXIMUM SHELL PLATE WASTAGE IN TANKS 17% - CURRENT MINIMUM THICKNESS 0.525 INCHES
MAXIMUM TANK TOP WASTAGE 28% - CURRENT MINIMUM THICKNESS 0.383 INCHES