Halloween Heavy Transport Horror Stories

a case study

The Works international

PRESENTED BY

in association with

ITI Industrial Training INTERNATIONAL

SPEAKER: MARCO J. VAN DAAL

MULTIPLE RO-RO OPERATION

C-JACKET	1,100 TON
C-DECK	800 TON
B-JACKET	1,300 TON

LOCATION

ARANSAS PASS, TEXAS

SCOPE OF WORK

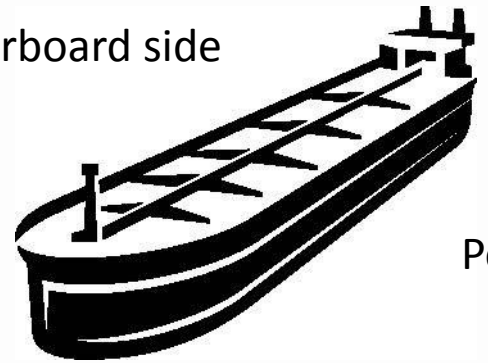
SUPPLY OF EQUIPMENT (EXCL. BARGE) AND ENGINEERING

SCHEDULE

DAY 0	MOBILIZATION OF EQUIPMENT
DAY 1	BUILDING CONFIGURATIONS AND POSITION UNDER C-JACKET
DAY 2	LOAD-OUT (RO-RO) OF C-JACKET
DAY 3	RECONFIGURE TRANSPORTERS AND POSITION UNDER C-DECK
DAY 4	LOAD-OUT (RO-RO) OF C-DECK
DAY 5	RECONFIGURE TRANSPORTERS AND POSITION UNDER B-JACKET
DAY 6	LOAD-OUT (RO-RO) OF B-JACKET
DAY 7	DEMOBILIZATION OF EQUIPMENT

MAP

Barge terms, the nautical world



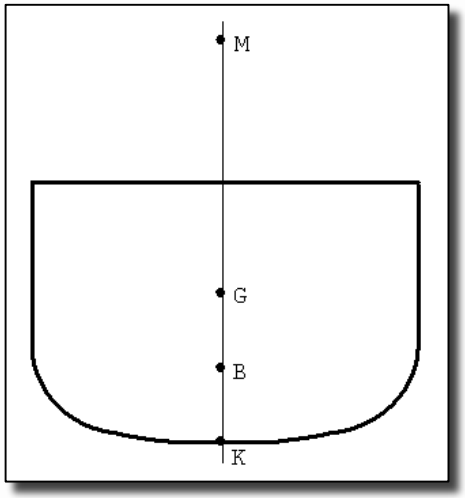
Keel, lowest point of the boat/barge

Draft, vertical distance from waterline to keel, the part of the boat/barge that is submerged

Free board, vertical distance from waterline to deck, the part of the boat/barge that is not submerged

Trim, the difference in draft between bow and stern

Heel, the difference in draft between starboard and portside



Barge particulars

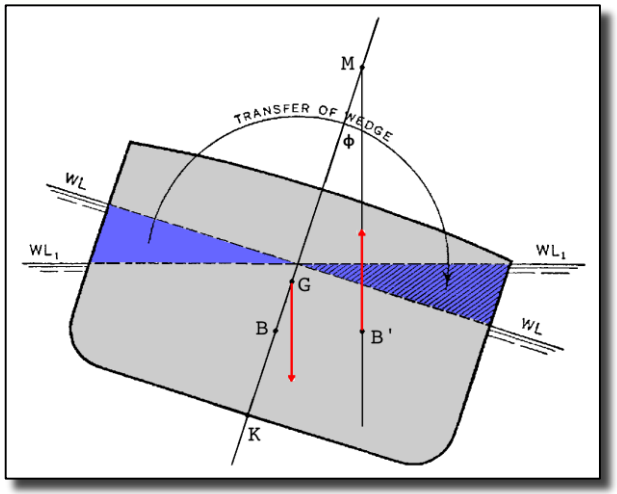
K. Point at the keel of the barge from where is being measured
Source: barge booklet

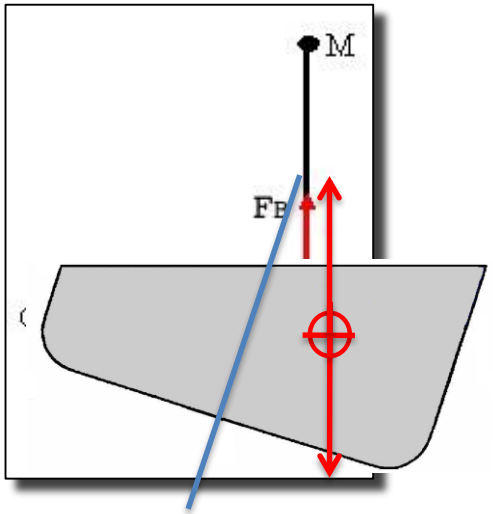
B. Center of Buoyancy
Source: hydrostatic particulars

G. Center of Gravity of Barge, cargo, ballast etc
Source: calculation

M. The transverse Metacenter, the point to which point G may rise and still posses a positive stability
Source: hydrostatic particulars

Righting arm in a stable environment





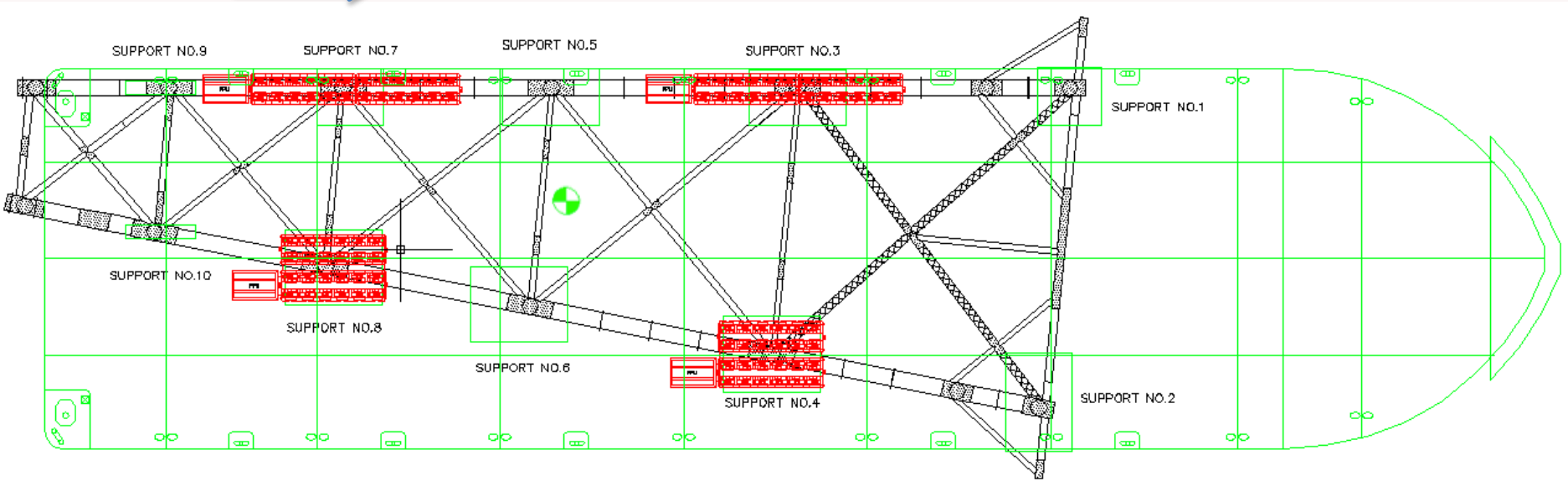
Due to the shifting of the CoB from B to B' a moment is introduced

The Buoyancy and Gravity forces create a righting arm

The righting arm attempts to return the barge to its equilibrium as long as G is below M
NOTE: As per Archimedes Fb=Fg

transport direction

C-JACKET



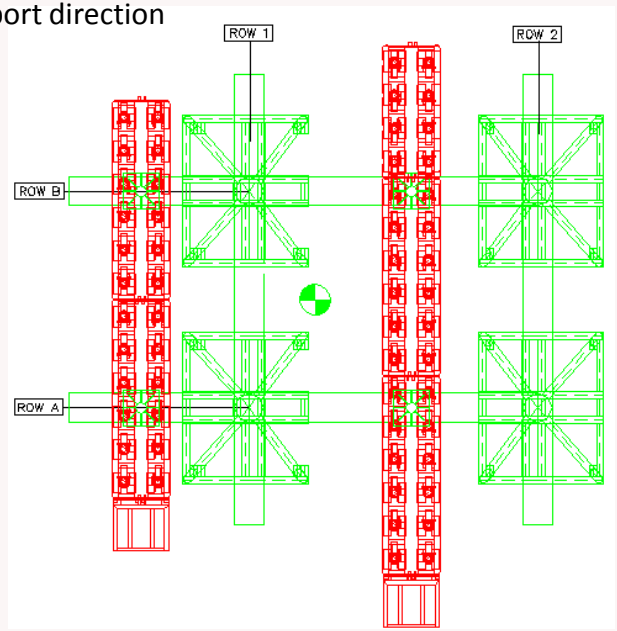
Weight = 1,100 ton
Overall dimensions (LxWxH)
85 x 36 x 36 mtr (280 x 120 x 120 ft)

48 axle lines x 30 ton = 1,440 ton capacity
2x12 axle line 360 ton capacity each
2x(6+6)axle line 360 ton capacity each

C-JACKET

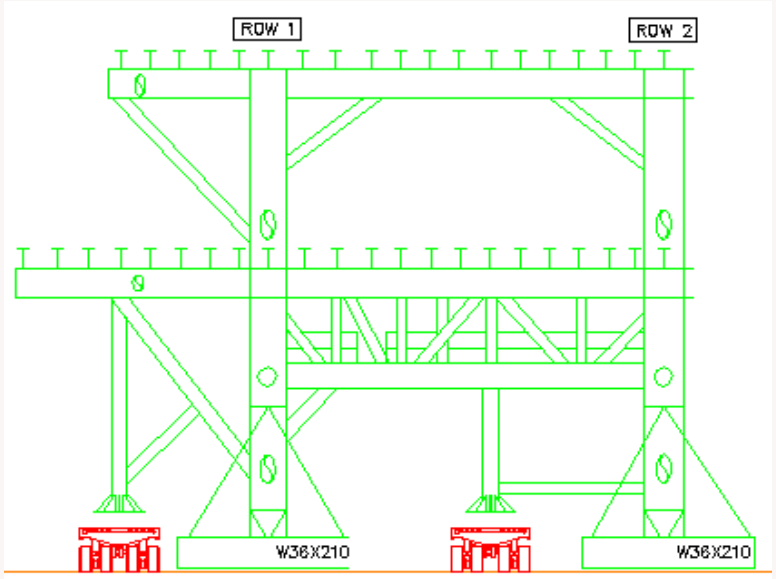
C-JACKET

transport direction



Weight = 600 ton
Overall dimensions (LxWxH)
18 x 18 x 24 mtr (60 x 60 x 80 ft)

C-DECK



28 axle lines x 30 ton = 840 ton capacity
1x12 axle line 360 ton capacity each
1x16 axle line 480 ton capacity each

C-DECK

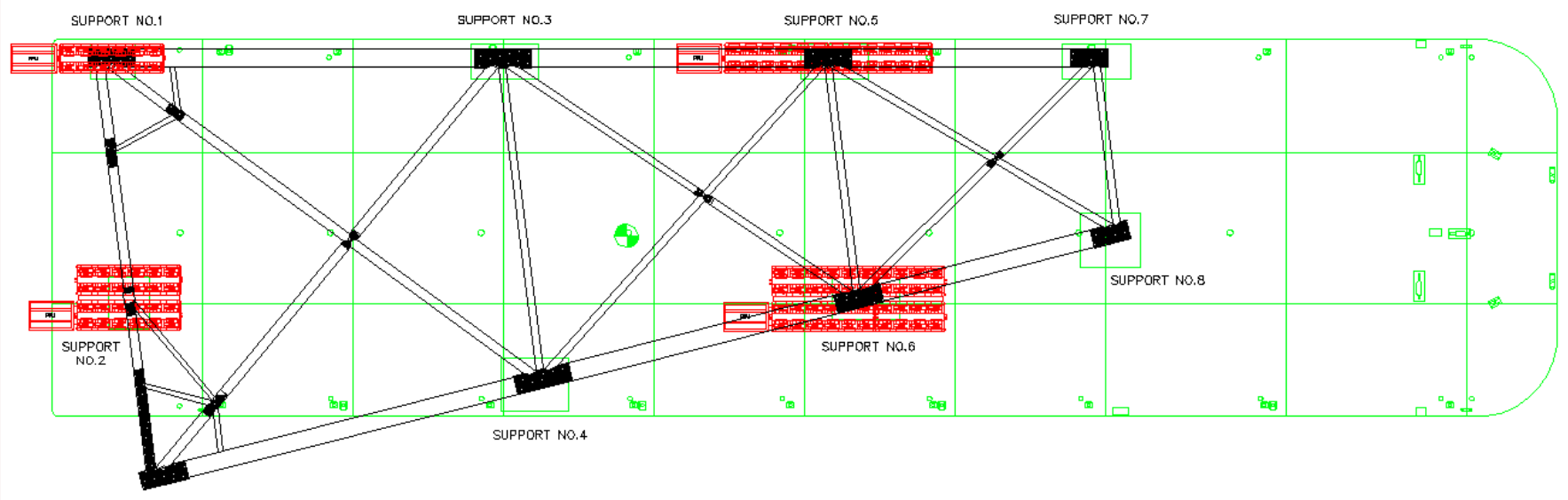

MARATHON
EG Production Limited
ALBA "C"
22 11:38


MARATHON
EG Production Limited
ALBA "C"
22 13:32

C-DECK

transport direction

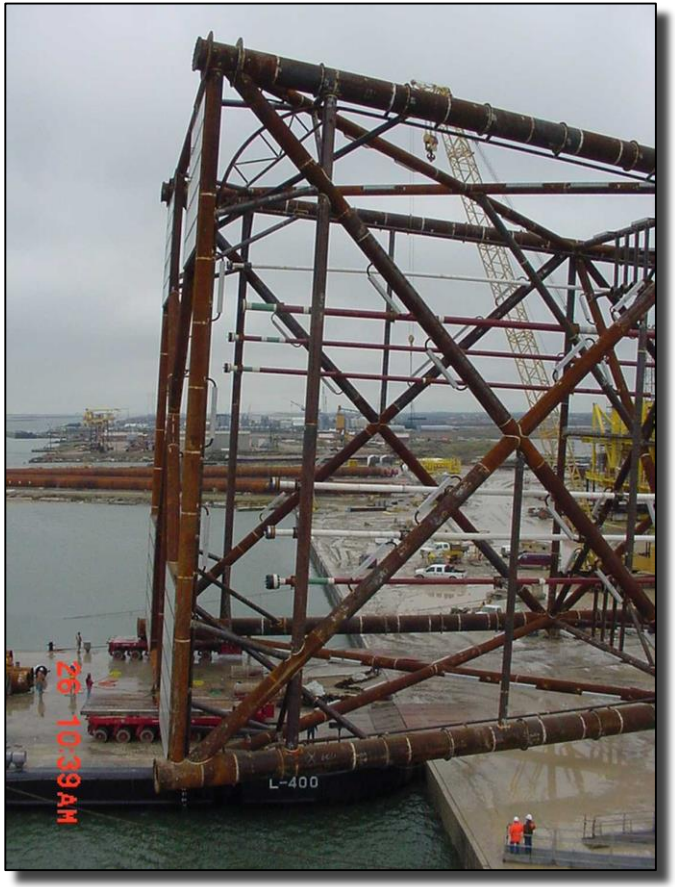
B-JACKET



Weight = 1,300 ton
Overall dimensions (LxWxH)
91 x 45 x 45 mtr (300 x 150 x 150 ft)

50 axle lines x 30 ton = 1,500 ton capacity
1x6 axle line 180 ton, 1x12 axle line 360 ton capacity
1x(6+6)axle line 360 ton, 1x(10+10) axle line 600 ton

B-JACKET



B-JACKET

In Summary

PROJECT STARTED ON TIME

PROJECT COMPLETED ON SCHEDULE

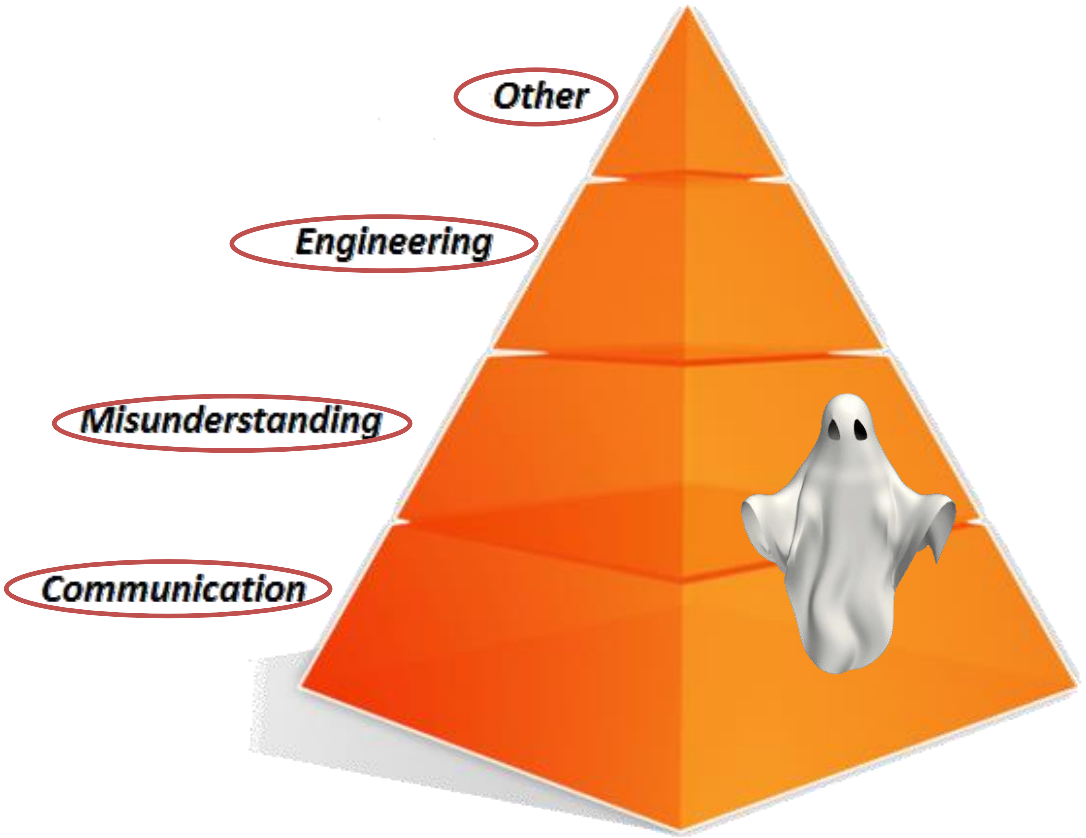
NO DAMAGE TO ANY OF THE CARGO

PERFECT EXAMPLE OF A WELL EXECUTED JOB

WHY WAS IT CALLED

“THE JOB FROM HELL”


R.I.P.


Other
Engineering
Misunderstanding
Communication

SO WHAT WENT WRONG

LACK OF COMMUNICATION BETWEEN SALES AND OPERATIONS

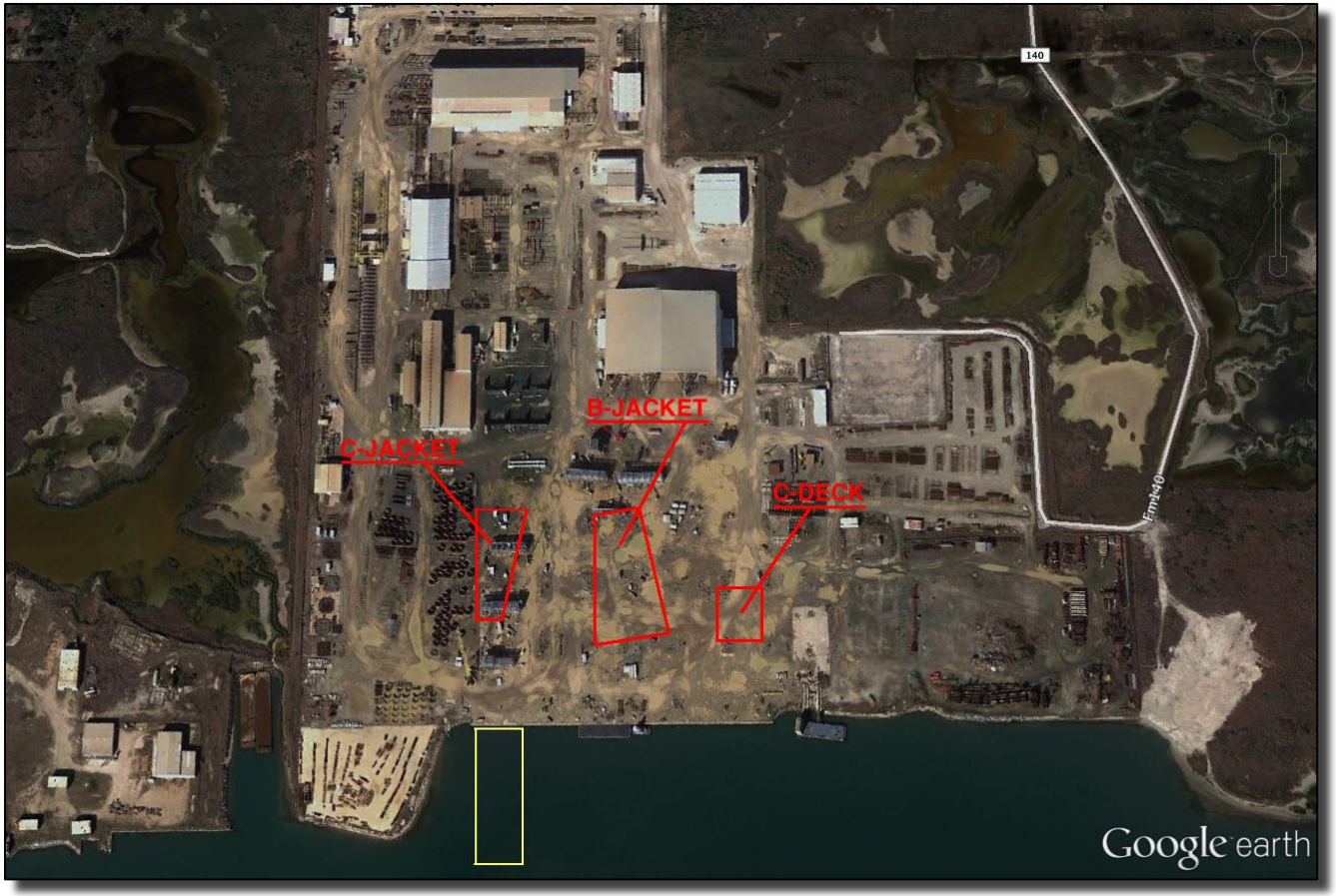
SIMULTANIOUS PROJECT EXECUTIONS

LACK OF COMMUNICATION WITH AND BY CLIENT

POOR PROJECT PREPARATION BY CLIENT

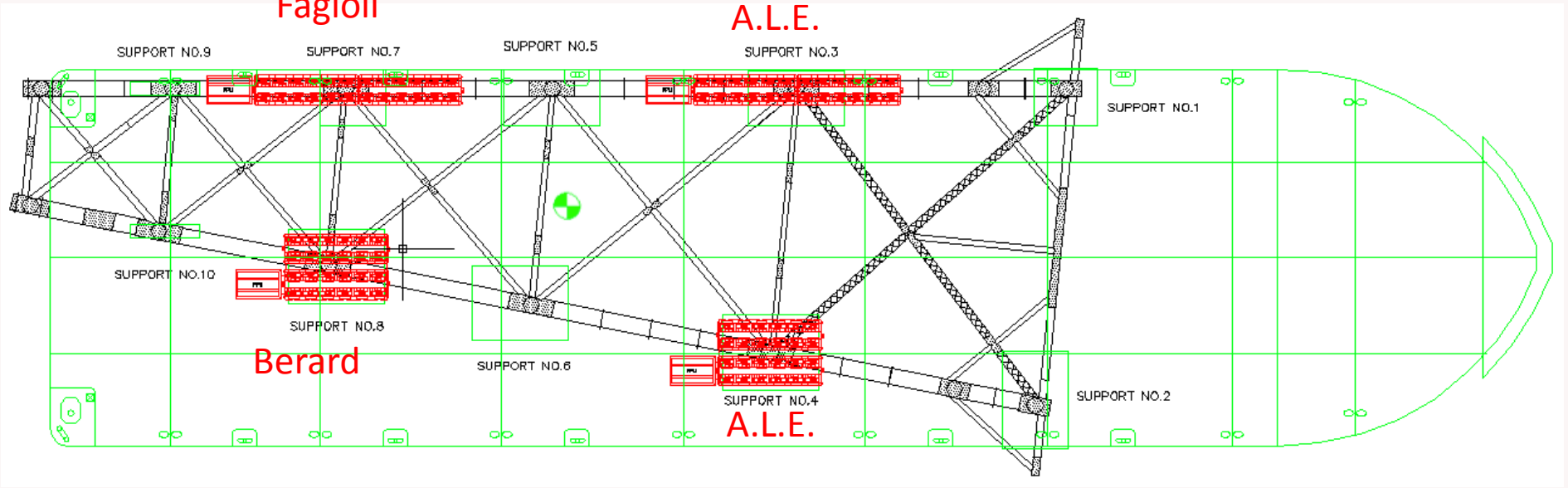
ACCEPTANCE OF CONDITIONS WITHOUT CHECKING THE IMPLICATIONS

C-JACKET



PALO VERDE NUCLEAR PLANT

C-JACKET



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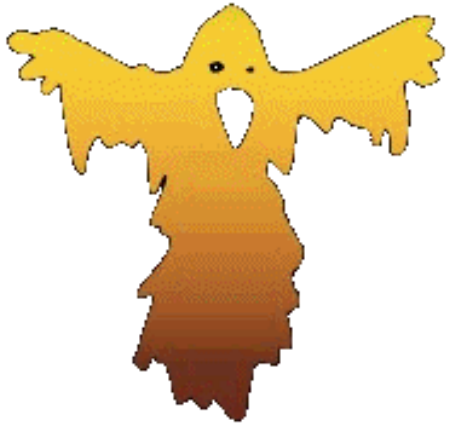


The support structures were designed for longitudinal forces only, making the 180 degree turn difficult.

C-JACKET

Pipes were laid out on the barge deck prior to the load out. They were not in the transporter travel path but they were a real challenge to deal with.

C-JACKET SUMMARY

JACKET HAD TO BE TURNED 180 DEGREES

SUPPORT STRUCTURE DESIGN BASED ON WRONG ASSUMPTIONS

MULTIPLE TRANSPORT COMPANIES

PIPES ON THE DECK MAKING THE LOAD OUT MORE DIFFICULT

LET'S LOOK AT SOME PICTURES

C-JACKET

Notice the track marks indicating the 180 degree move in motion.

C-JACKET

Multiple obstructions such as gas stations and field offices.

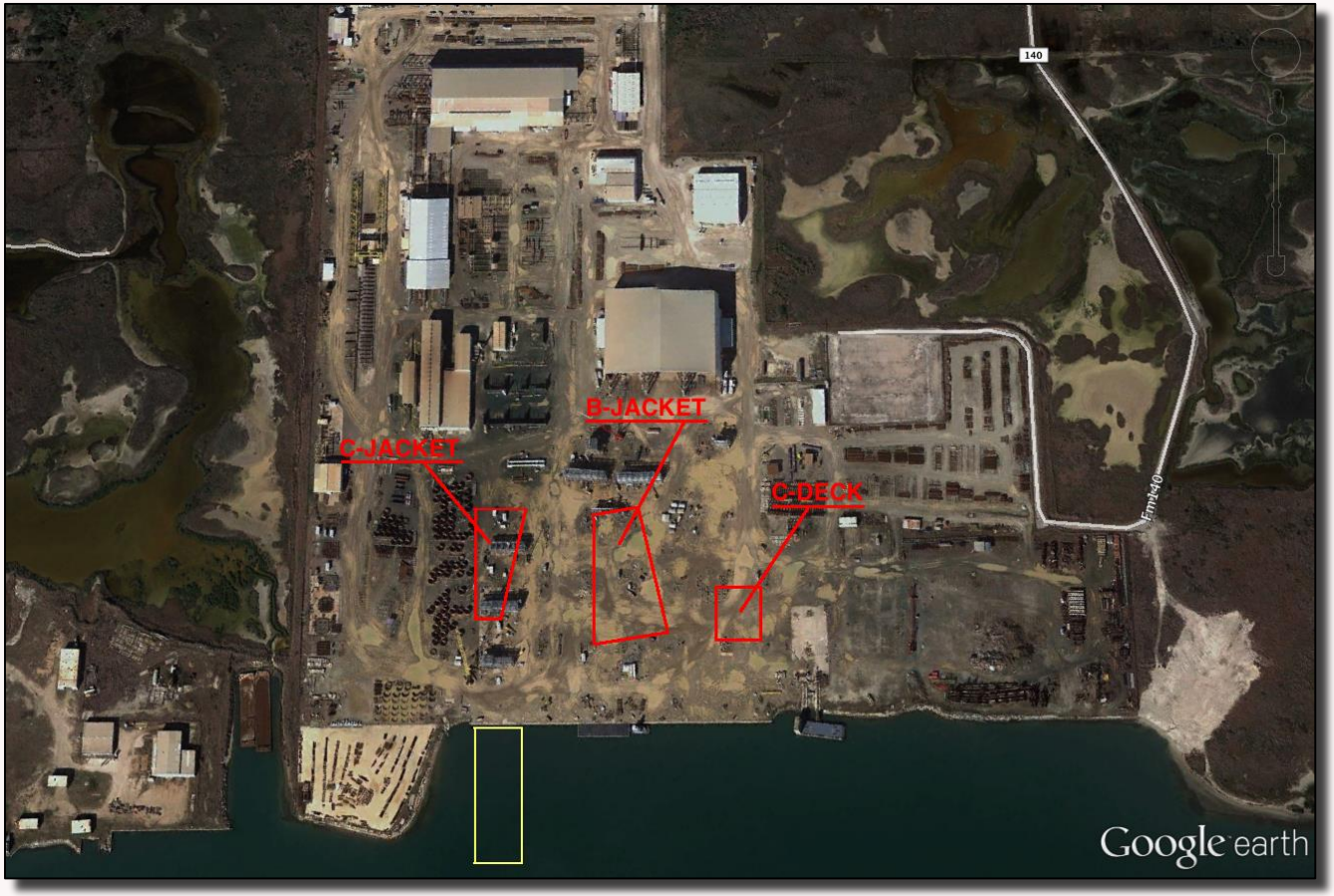
C-JACKET

It could not be any tighter.

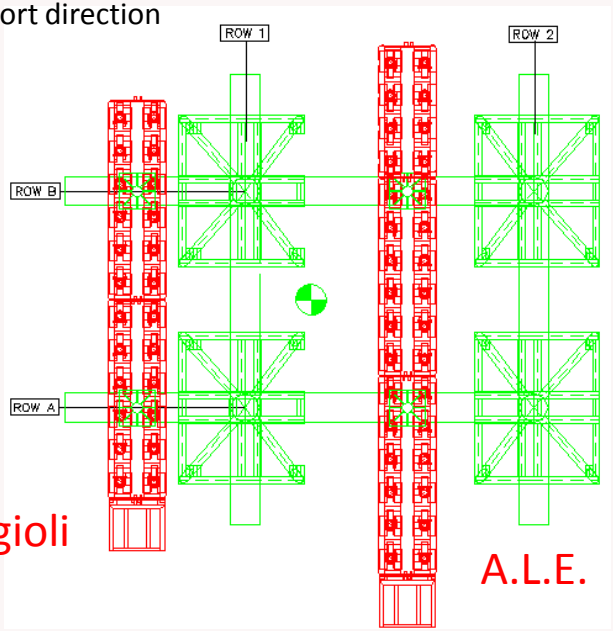
C-JACKET

It was so tight that a second barge was brought in to get the transporters off.

C-DECK



transport direction



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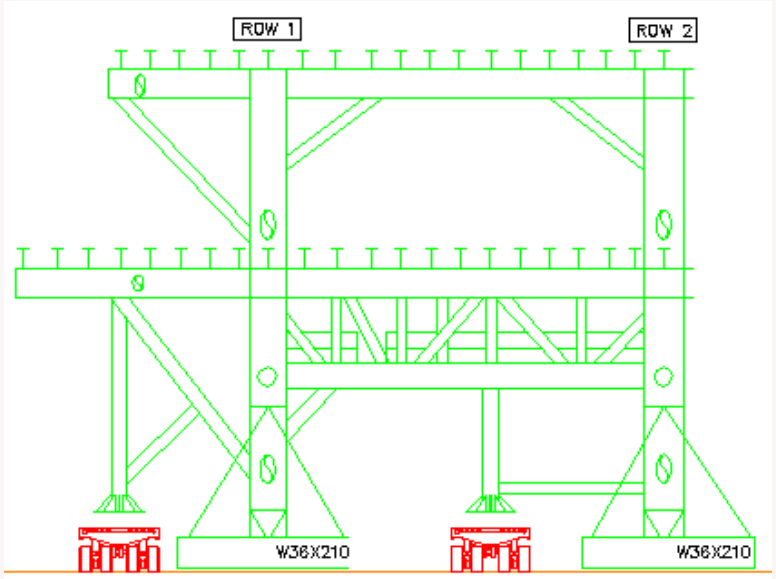

28 axle lines x 30 ton = 840 ton capacity
1x12 axle line 360 ton
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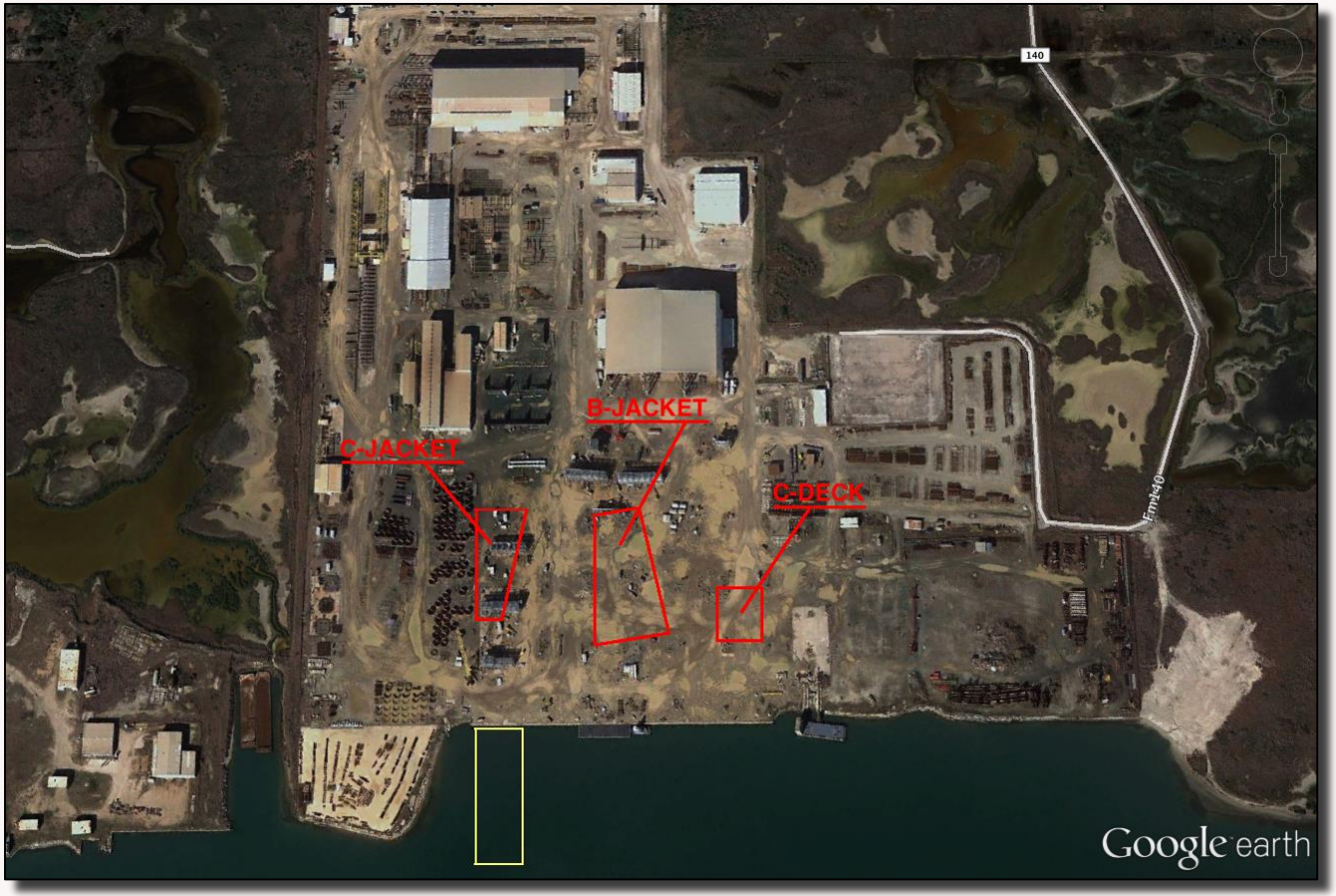
C-DECK

The C-DECK load out actually went smooth, just a flat tire on each of the transporters that needed to be isolated.

B-JACKET

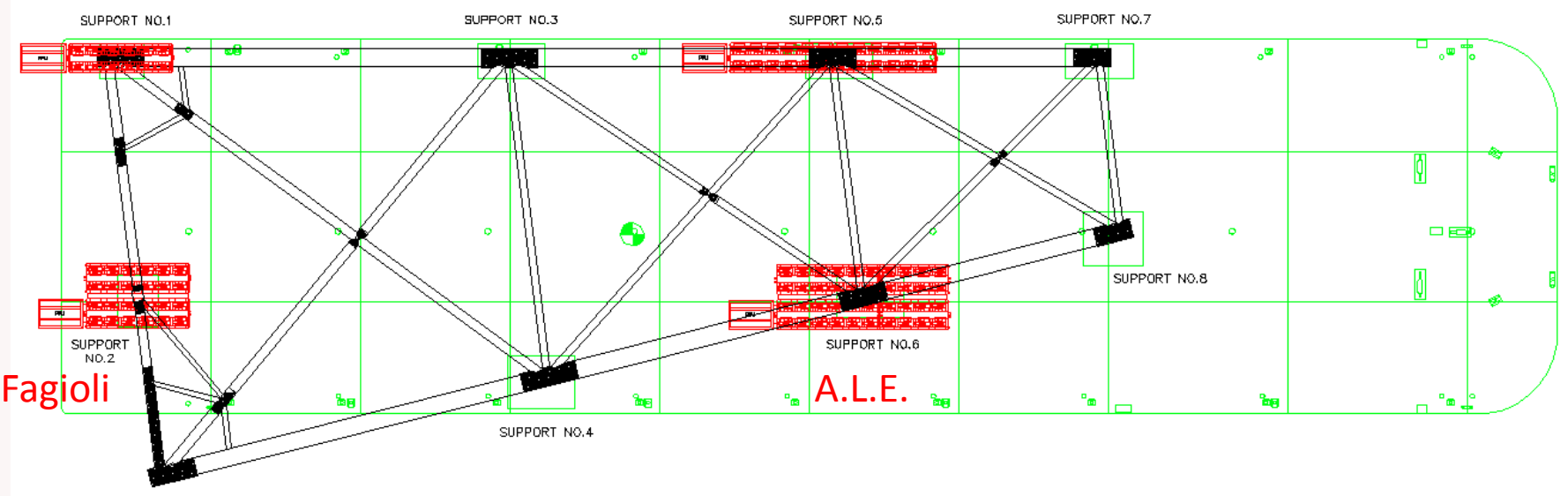


transport direction

Fagioli

Fagioli

B-JACKET



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B-JACKET SUMMARY

AFTER THE C-JACKET EXPERIENCE, EVERY PIECE OF INFO WAS CHECKED

SUPPORT STRUCTURES WERE MUCH LOWER, STABILITY WAS OK

MULTIPLE TRANSPORT COMPANIES

PIPES ON THE DECK MAKING THE LOAD OUT MORE DIFFICULT

LET'S LOOK AT SOME PICTURES

B-JACKET

The support structures allowed for both longitudinal as well as lateral forces.

B-JACKET

The barge was not big enough.

Normally used for launches (where a jacket is slid off the barge) the angled part of the deck was overlooked.

Execution date, 26 January 2003

Crew just completed loading the 1,300 ton module

It was a sunny day….. than it started to rain….

It started to rain bad….

And with 2 transporters on the barge, disaster struck..

One rear transporter (2x10) stopped moving

A 6-axle had to be exchanged due to damage

B-JACKET

A flat tire, cut by the steel plates, was caught just in time.

B-JACKET

The entire site turned into a mud bath, but around midnight we rolled the last axles onto the barge.

B-JACKET

The next day, the final positioning on the barge was carried out. Like with the C-JACKET it was tight.

B-JACKET

But the B-JACKET still had an unexpected twist. Even though the front two transporters were 6-axle units, their position was slightly skewed due to the B-JACKET shape.

This was one of the best views of the project.
B-JACKET on the barge with in the background the C-JACKET and C-DECK on the other barge.
Project completed.

THANK YOU FOR YOUR ATTENTION !!

The Works international in association with Industrial Training INTERNATIONAL