

M / V Algoville.

Adversity to Opportunity.

Ken Westcar
Toromont MaK
SNAME Great Lakes / Great Rivers.
Cleveland, March 1st 2007



M/V Algoville (built as “Senneville”, St. John, NB –1967)

Managers: **Seaway** Marine **Transport.**



Particulars:

- LOA: 730'
- Beam: 78'
- Capacity: 31,752mt.
- Speed: 15.5 kts.
- MAN KZ78/155E, 9900bhp @ 115rpm.
- KaMeWa propeller.
- MAN 550kw aux. (2)
- 1000bhp diesel b/t.

M/V Algoville.

Catastrophic main engine failure in May 2006.

- Piston seizure.
- Major damage to cylinder head and entablature.
- No injuries.
- No possibility of running on five cylinders.



M/V Algoville.

Available options:

1. Scrap the ship or turn into a barge. (last resort)
2. Order new entablature section from MAN. (long delivery)
3. Source new entablature section from China. (high risk)
4. Find used engine for parts. (none found available)
5. Replace entire propulsion system. (chosen option)



Accepted Toromont proposal for **MaK 8M43C** and JaKe gear.

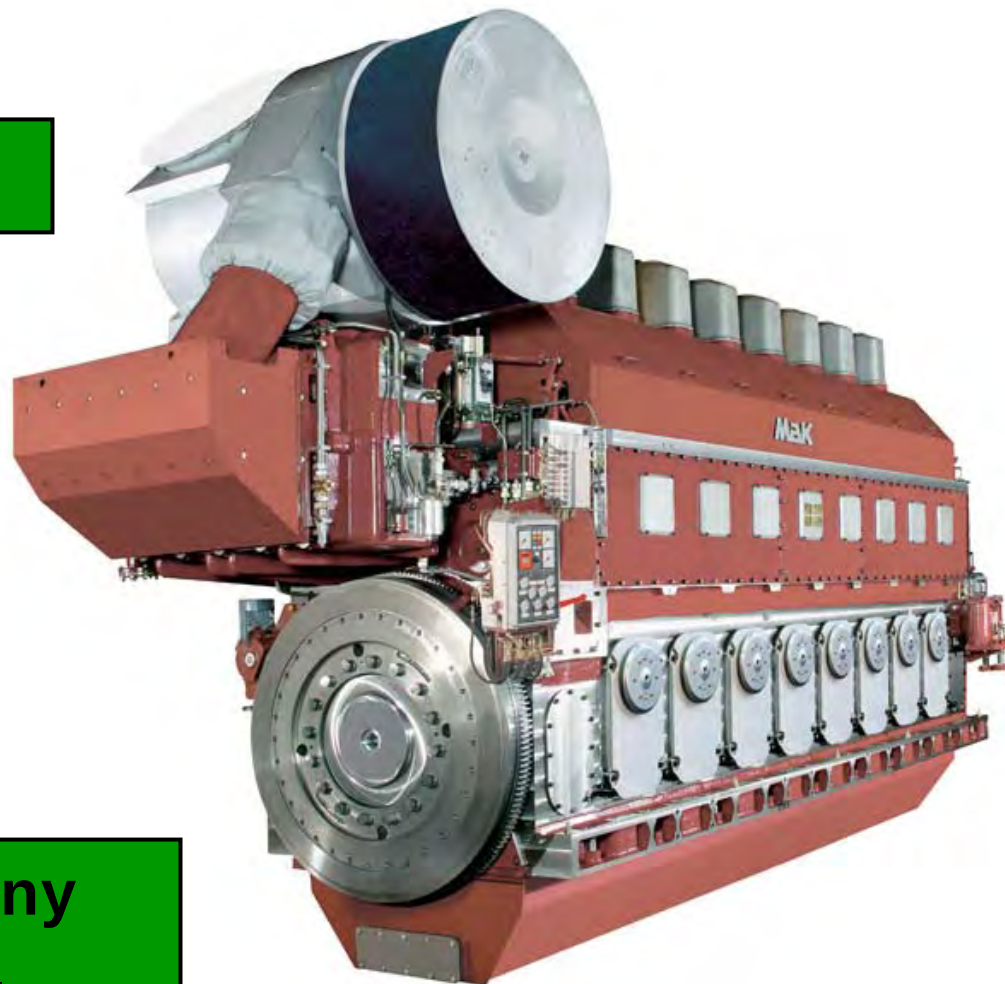
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Comparative data:

	<u>MAN KZ78/155E</u>	<u>MaK 8M43C</u>
•Type:	2 stroke, 6cyl.	4 stroke, 8cyl.
•CSR power:	7367bkw / 115rpm.	8000bkw / 500rpm.
•BSFC:	211g / kw / hr.	177g / kw / hr.
•BSOC:	u / k.	0.6g / kw / hr.
•Clutch / red. gear:	No.	Yes.
•Economizer:	No.	Yes.
•Shaft alternator:	No.	Yes.
•Bridge control:	No.	Yes.
•Single person engine room:	No	Yes.
•Weight delta (est.)	----	-500 tons.

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MaK 8M43C engine.



Built in Rostock, Germany
by: Caterpillar Motoren.

TOROMONT
Power Systems



MaK

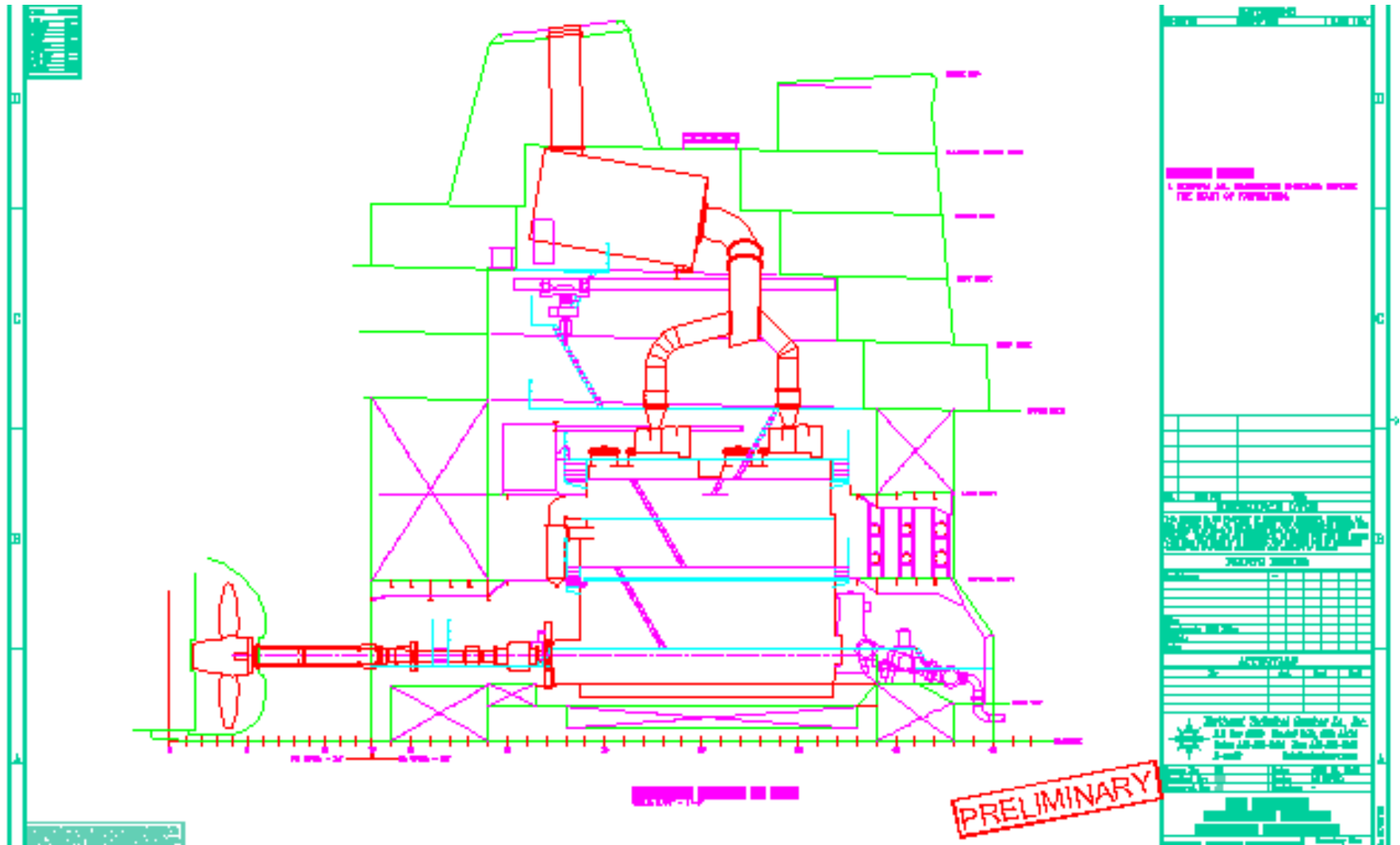
M/V Algoville.

Ship productivity and environmental considerations:

- **IMO Annex VI exhaust emission compliant (upgrading possible).**
- **Higher vessel speed (more trips) without fuel cons. penalty.**
- **Reduced lube oil consumption and leakage to bilge.**
- **Economizer will displace 50 % of aux. boilers IF180 fuel cons.**
- **Shaft alternator will displace 50 % of aux. genset MDO usage and reduce running hours on units (Caterpillar 3508).**
- **Reduced engine room crewing with full bridge control, removal of large number of redundant systems and equipment.**
- **Improved asset management with MaK DICARE system.**
- **Higher capacity cooling system for warmer lake temperatures (avoid derating during summer months).**
- **Smaller on-board parts inventories and storage cost.**

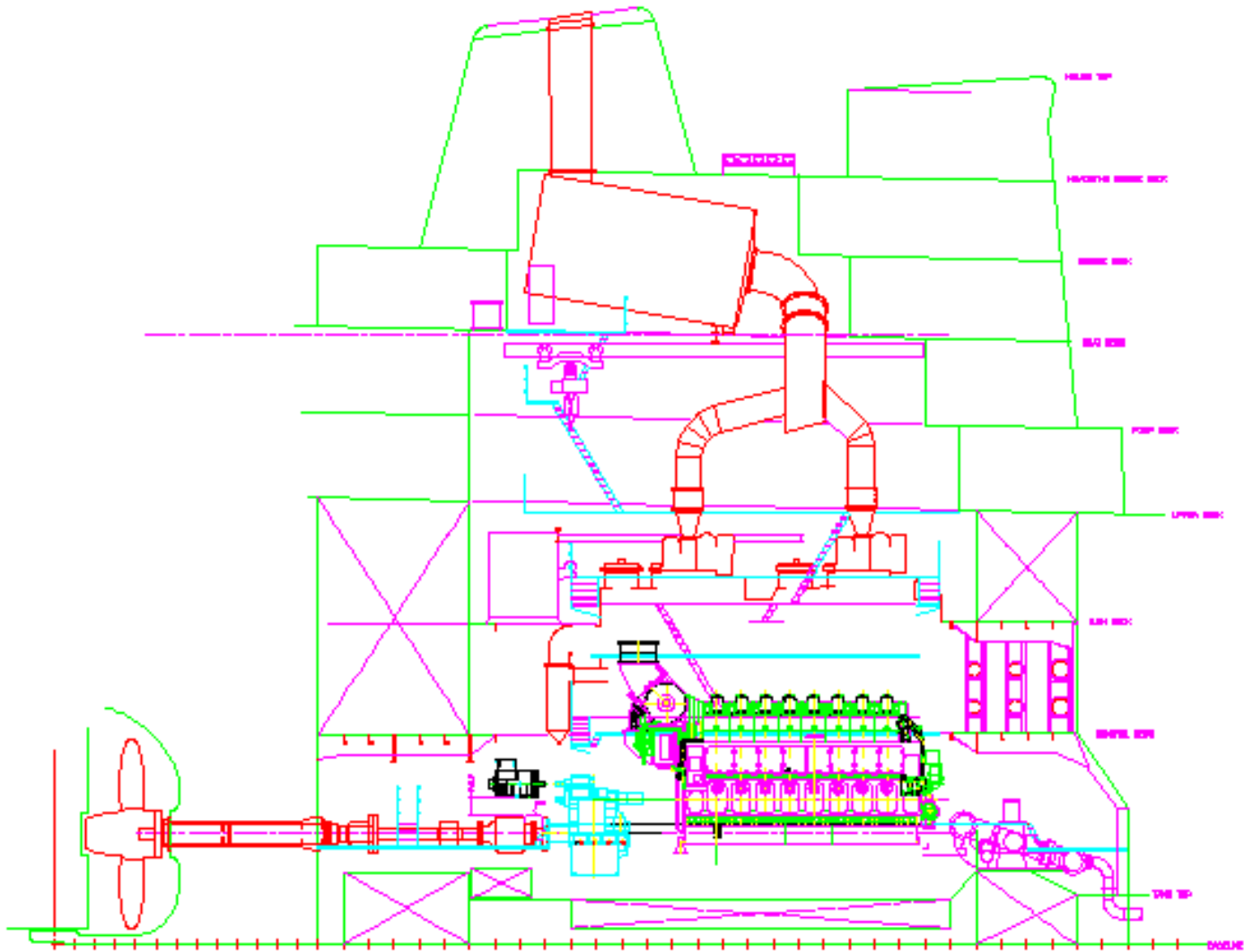
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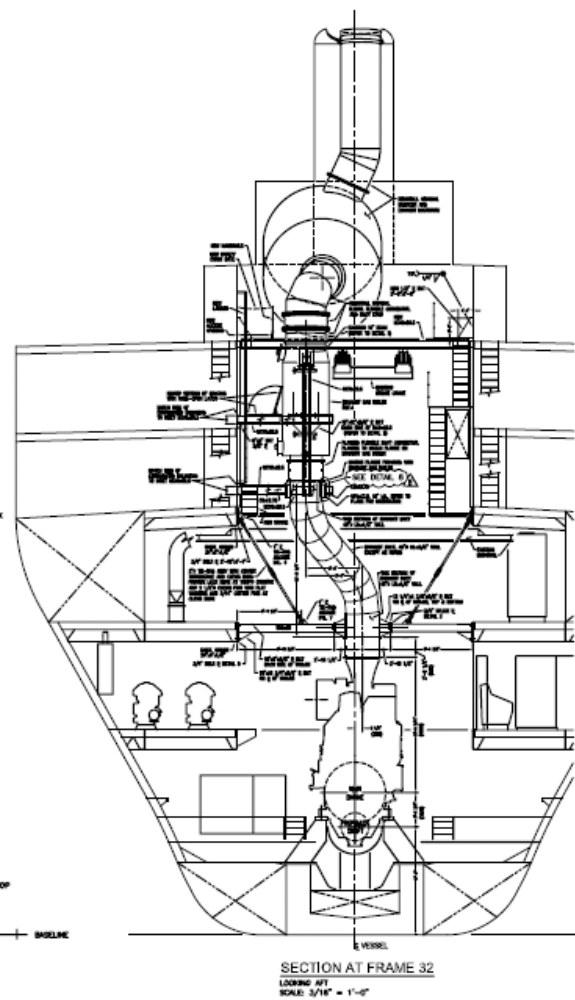
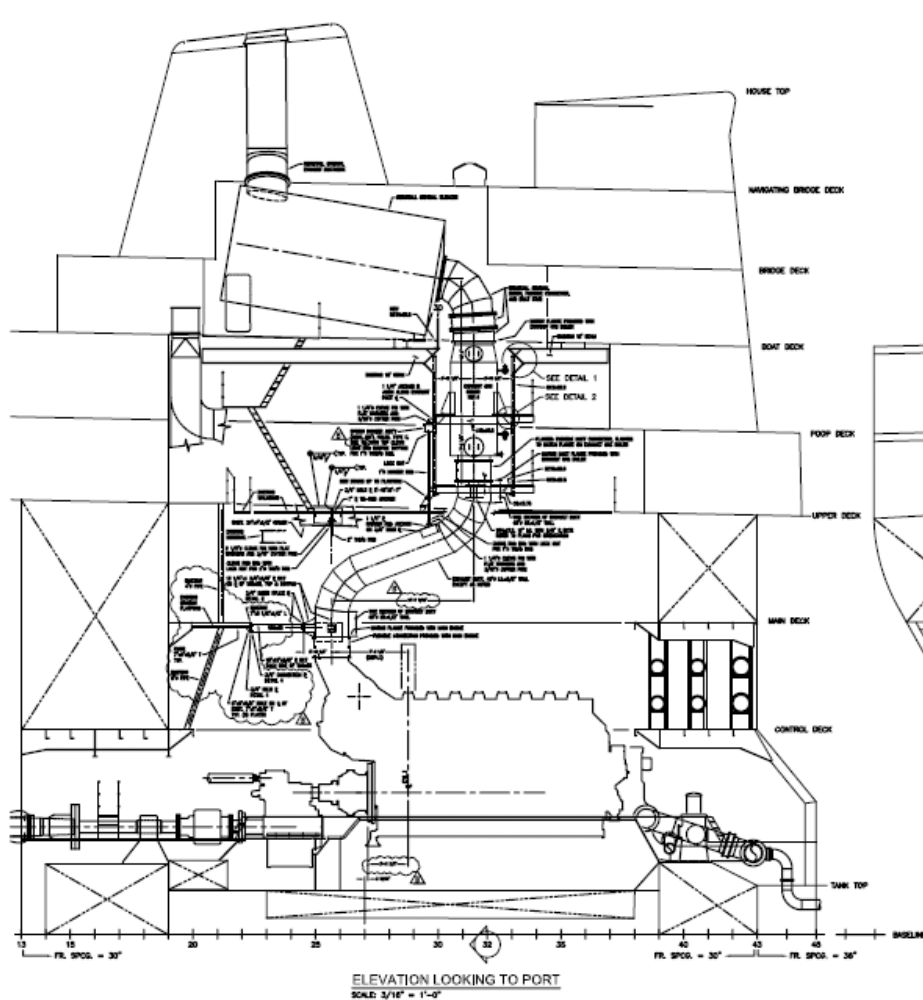
Installation original.



M/V Algoville.

Installation conceptual.





GESAB unit:

- 1500kg/hr @ 7bar.
- Delivers to existing aux. boiler steam space.
- Low installed weight.
- Low exhaust backpressure.



In position.



Dump condenser.



M/V Algoville.

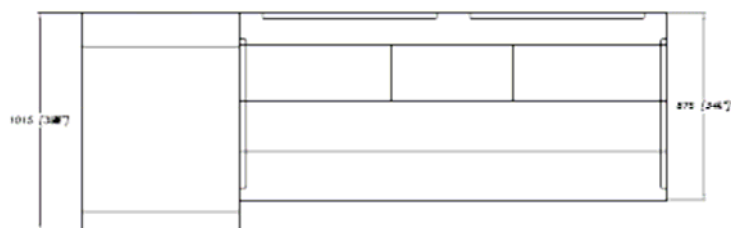
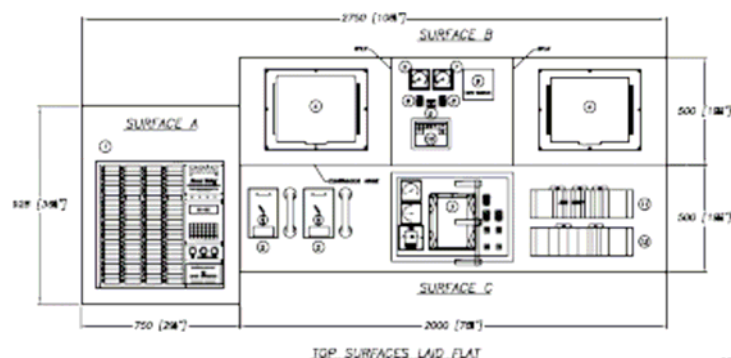
New equipment listing:

- MaK 8M43C engine.
- JaKe reduction gear with Pneumaflex clutch coupling.
- Stamford 750kw shaft alternator with Spiroflex coupling.
- GESAB 1500kg/hr @ 7bar exhaust economizer.
- Kupke and Wolfe fuel heater/booster module.
- Plate coolers for main engine for 30C raw water.
- MaK DICARE trending system.
- Alfa-Laval lube and fuel oil purifier modules (owner supply).
- Prime Mover Controls propulsion control and alarm system.
- Machinery control room console and new wheelhouse desktop.
- Two Caterpillar 3508, 560kw, 1200rpm generator sets (owner supply).
- Switchboard upgrade (owner supply).

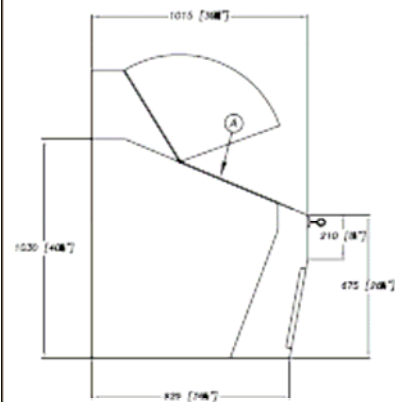
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Engine room console.

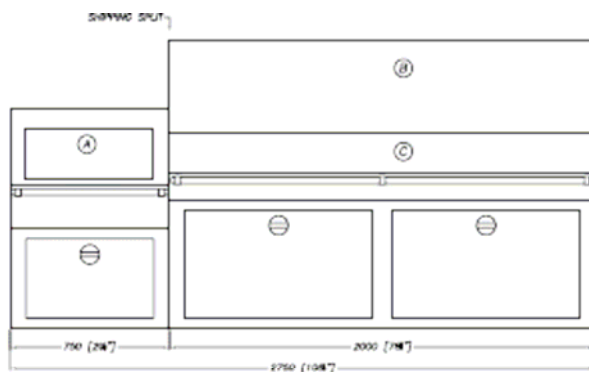
EQUIPMENT LIST		
ITEM	QTY.	DESCRIPTION
1	1	PMC LOCAL OWN CHIEF ALARM PANEL
2	2	SOUND POWERED PHONES
3	1	MAIN ENGINES CONTROL
4	2	MONITORS
5	1	FW STOP
6	1	TURBOCHARGER RPM INDICATOR
7	1	START AIR PRESSURE INDICATOR
8	2	CONTROLS
9	1	EMERGENCY TELEGRAPH SIGNALS
10	1	MAK ENGINE CONTROL PANEL 2
11	1	SAFETY SYSTEM
12	1	RPM SWITCHING UNIT
13	1	PMC PANEL (INSIDE)
14	1	SAFETY SYSTEM TERM STRIP X55 (INSIDE)
15	1	RPM SW UNIT TERM STRIP X15 (INSIDE)
16	1	CHARGE AIR PREHEAT UNIT (INSIDE)
17	2	COMPUTERS (INSIDE)



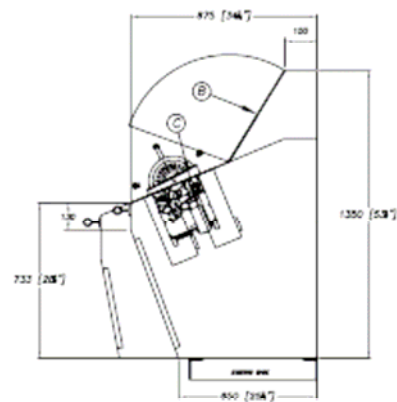
TOP VIEW



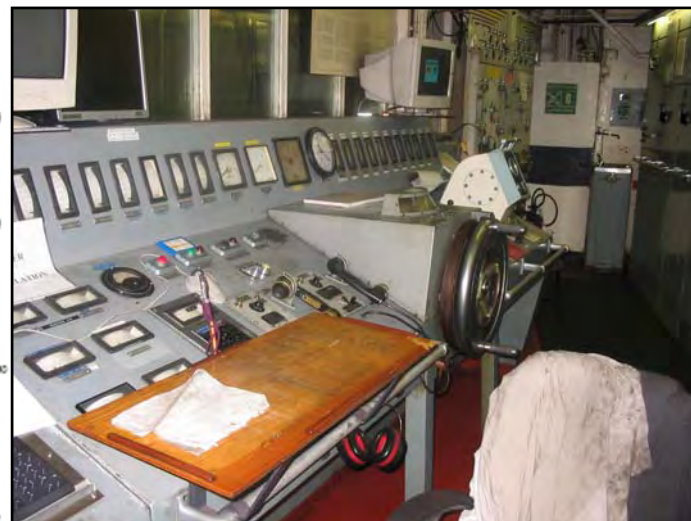
LEFT SIDE ELEVATION



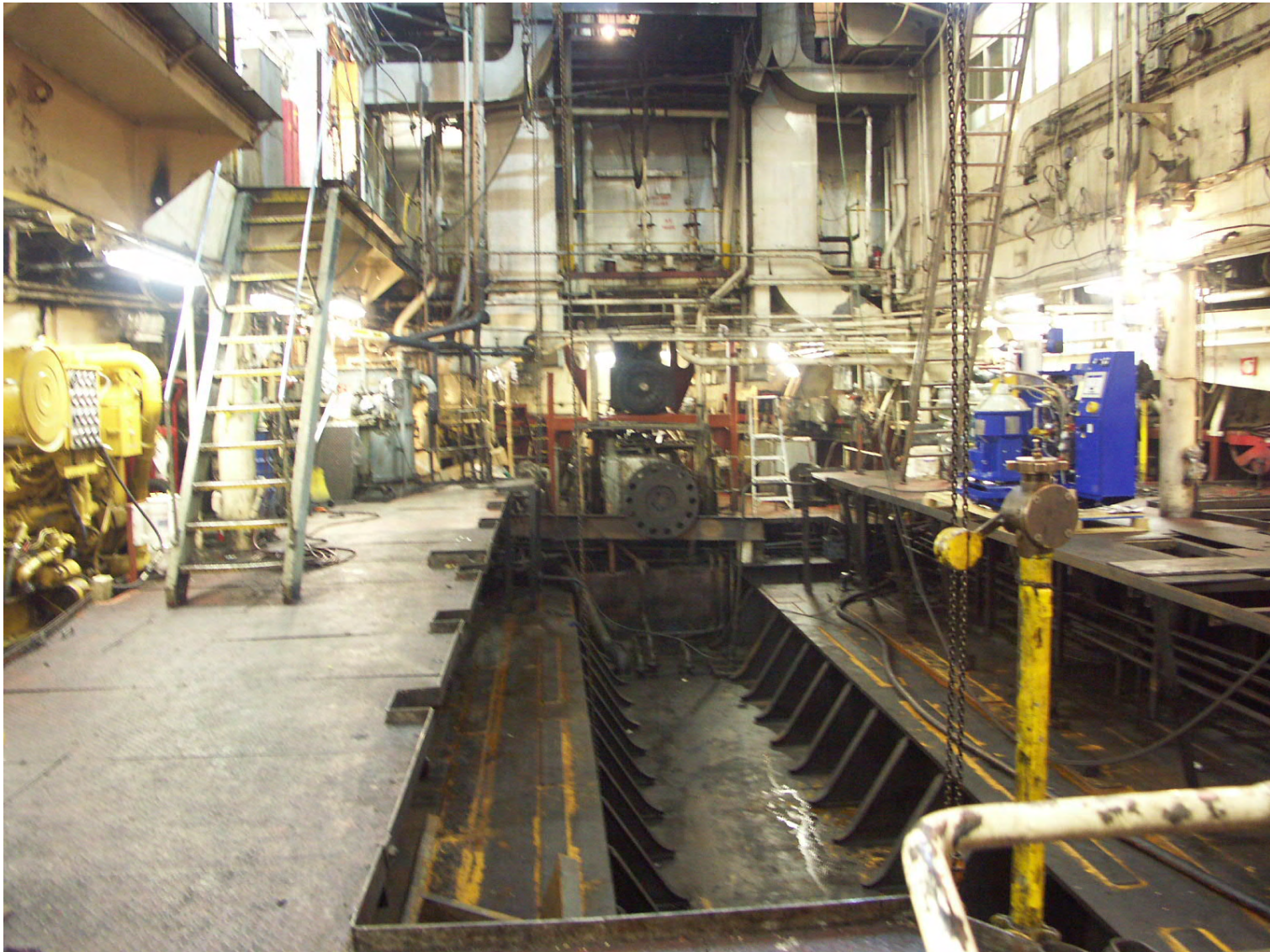
FRONT ELEVATION

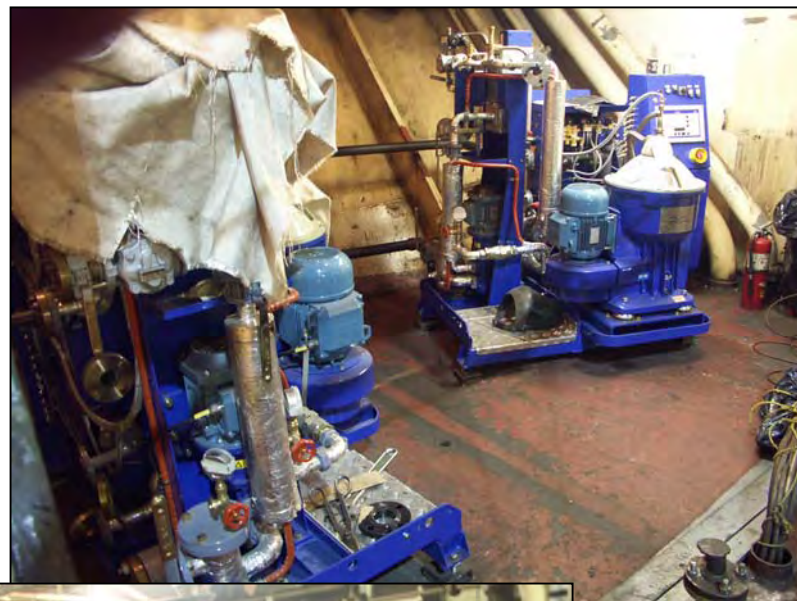
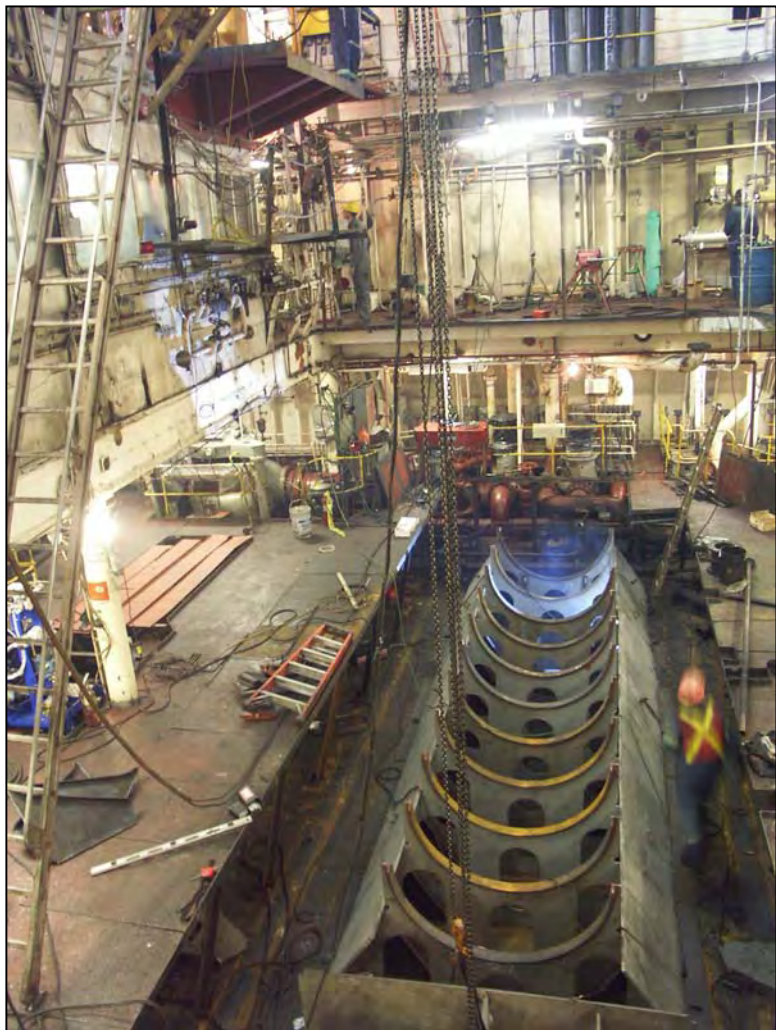


RIGHT SIDE ELEVATION



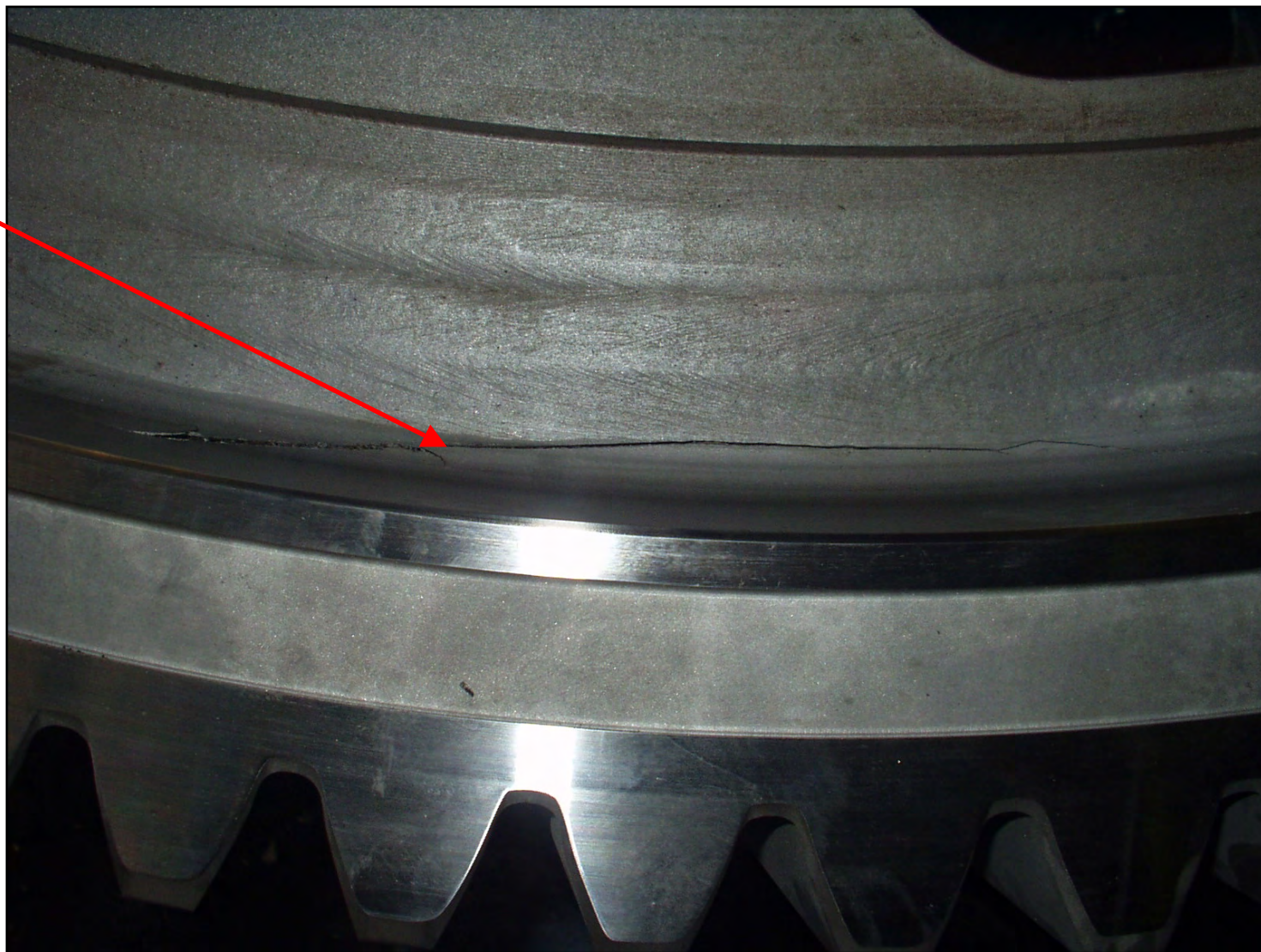
REV.	DESCRIPTION	DATE	BY
1	Canal Marine & Industrial Inc. 200 Lakeshore Road Scarborough, Ont. M1S 1C1 Phone: (416) 291-1111 Fax: (416) 291-1111		
2	TOROMONT		
3	M.V. "ALGOVILLE"	06-21-0406	
4	ECR CONSOLE ARRANGEMENT		
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Stress crack during heat treat of low speed pinion. Component is now scrap!

Additional one month delay in gearbox delivery.



M/V Algoville.

Project team:

- Machinery package and integration: **Toromont Power Systems.**
- Naval architecture and marine engineering: **NETSCO.**
- Project management: **North American Marine.**
- Electrical engineering and installation: **Canal Marine and Industrial.**
- Mechanical installation: **Allied Marine and Industrial.**
- International freight: **Karl Schenker.**
- Classification Society: **Lloyds Register.**
- Ship berthing: **Port of Hamilton.**

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Lessons :

- Do torsionals at earliest possible opportunity (coupling selection eliminated barred speed ranges on “Algoville”).
- Delivery commitments from suppliers are generally unreliable.
- Secure foreign exchange futures where possible.
- Shipping large engines in winter is problematic due to weight/height.
- Dock accessibility and load bearing capacity.
- Crane availability (crane capacity is approx. 8 times object weight).
- Be prepared to get dirty!
- Monitor project management costs.
- Use trusted suppliers and contractors (avoid unqualified low bid).
- Plan as far in advance as possible (24 – 36 months)

