

EXXON COMPANY, U.S.A.

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MARINE DEPARTMENT
ENGINEERING AND PLANNING

B J WERSTAK MANAGER

W N EKSTRAND — ENGINEERING
R J MEYERS — ENVIRONMENTAL CONSERVATION
S F GOLDMANN — ECONOMICS AND PLANNING
W F ROBINSON — OCEAN TONNAGE

November 7, 1978

Re: Exxon GALVESTON Ship Service
Generator Failures

TO BE FILED

MARINE DEPARTMENT

P. T (6 mo.)

Mr. G. Guy Via, Jr.
Vice President, Ship Repair Sales
Newport News Shipbuilding
4101 Washington Avenue
Newport News, VA 23607

Dear Guy:

As I indicated in our conversation on November 2, 1978, the problems with the GALVESTON ship service generators have still not been completely solved. My telex of October 2, 1978 to you described the initial problems. Since then we have attempted to get the generators repaired through Virginia Tractor and Electric Machinery. These vendors and our West Coast Fleet Office arranged to have the San Francisco area Caterpillar representative, vibration consultants and electric repair shops make repairs. These vendors worked unsuccessfully on both generator sets for about two weeks. The port generator was then replaced by a Caterpillar unit to minimize further disruption in the ship schedule. The starboard generator set was reassembled using the original Electric Machinery generator.

The repairs to the port generator are apparently satisfactory. However, additional work is needed on the starboard generator, as the engine oil seal still leaks and vibration is apparently getting worse. Prior to doing any additional work on that unit, we would like to have Virginia Tractor review all experience to date, reevaluate the generator set design, and make a determination as to whether or not the Electric Machinery generator should be retained. Unless they can satisfactorily prove that the Electric Machinery generator set will be reliable, we would prefer to change that generator over to a Caterpillar unit. The summary of our experiences with the generator sets since redelivery of the vessel is as follows:

- o Diesel generator sets apparently operated satisfactorily in February 1978 except for leaking oil seals on both engines. There was no significant vibration when the units were originally installed.
- o Both engine oil seals were replaced at Port Neches in March, 1978. This repair was apparently satisfactory and again, no significant vibration was present.

- o When the vessel arrived at the West Coast in July, 1978 both engine oil seals were leaking.
- o On September 28, 1978 I reviewed the generator situation with George Brasewell. George agreed that I could notify Virginia Tractor directly and request warranty service for the generator sets.
- o I notified Pat McGovern of Virginia Tractor on September 28, 1978. I asked him to arrange with the San Francisco area Caterpillar dealer for service. I also asked that he arrange for an Electric Machinery service representative to visit the ship.
- o For the next two weeks our West Coast office made frequent attempts to get an Electric Machinery representative at the ship. I also contacted their service manager, marketing manager, and executive vice president in an attempt to get a service representative to the ship. They finally provided a service man at the ship on approximately October 15, 1978.
- o Summary of repairs and modifications is as follows:
 - Kaiser Associates, a San Francisco area vibration consultant, made the determination that the rotors on both generators were out of balance. They attempted in place balance of both rotors. These repairs were unsatisfactory and the rotors were removed to an electric repair shop for rebalancing. Rotors were checked mechanically, rebalanced, and reinstalled in the ship. Both generators continued to vibrate after reassembly. On approximately October 12, we decided to change the port generator to a Caterpillar unit. This decision was made after Herb Leyendecker consulted you.
 - The Electric Machinery representative completed repairs to the starboard generator on October 20, 1978. These repairs included installing a support at the rear of the engine, realigning the generator, installing fabreeka isolation mounts under the generator skid, and installing flexible piping connections between the engine and fixed piping. With these repairs, the vibration level of the generator was reduced to an acceptable level. However, the generator oil seal still leaks.

With these repairs, Electric Machinery left the ship with the impression that the generator was operating satisfactorily, and that no further repair or modification is needed. However, I have again notified Virginia Tractor and Electric Machinery that we still have a problem with the diesel generator set and that follow-up action is required as the oil seal still leaks and the vibration is getting progressively worse.

I feel that before any additional attempts to repair the generator set are made, the following questions should be answered:

- o How many of these particular generator sets are in service? I have received conflicting reports as to how many BEMAC-3 generator sets are in service. Unless Electric Machinery can establish that this is a field tested and satisfactory unit, we should not proceed with attempts to repair it.
- o What mounting arrangements are used on successfully operating Caterpillar D353/Electric Machinery generator sets? This includes mounting arrangements at the rear of the diesel engine and exact location of mounting feet at the generator.
- o Determine whether or not a pilot shaft is needed between the engine crankshaft and generator rotor to establish proper alignment.
- o Review the history of balance of both rotors. We appear to have conflicting reports as to what amounts of weight were needed to balance each of the rotors.
- o What mounting arrangements are used for the generator fan? Determine if it is possible to reinstall the fan in such a way as to disturb rotor balance.
- o What alignment procedures were used by Peterson Tractor each time the generator set was reassembled after attempts to repair oil seal leaks? Determine whether or not misalignment was the cause of the vibration problems.
- o Review all possible causes for engine oil seal leaks and eliminate these possibilities before concluding that generator vibration is causing leaking oil seals.

Assuming we decide that the Caterpillar D353/Electric Machinery generator set is a satisfactory design and that reliable repairs can be made, the following additional work is needed:

- Repair the leaking engine oil seal.
- Modify the engine/generator mounts, if deemed necessary.
- Install crankshaft/rotor pilot shaft, if deemed necessary.
- Change out the flex pack between the rotor/engine crank shaft. The original flex pack is still installed. It is apparently defective and may cause misalignment.

As agreed in our conversation, Virginia Tractor should be the one to reevaluate their design and method of assembly of the diesel generator sets. They should answer my above questions, and any other possible questions relating to the design and installation. Once they have completed that review, we can decide whether or not we will make any additional attempts to repair the remaining Electric Machinery generator, or change that unit over to a Caterpillar generator.

I would appreciate your notifying Virginia Tractor as quickly as possible to expedite this design review. We can then decide whether to attempt to repair the generator set or change to a Caterpillar generator. Once repairs are complete I will forward a breakdown of warranty related costs.

Sincerely,



P. J. Grossweiler

PJG:sb

bcc: Mr. H. J. Borgen
Mr. W. N. Ekstrand
Mr. H. P. Leyendecker
Mr. D. J. Paul (WCFO)
Mr. K. I. Peters (WCFO)
Mr. B. J. Werstak