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An Automated Marine Propulsion Plant

Last January U. S. Maritime Administrator Donald W. Alexander made an address in New York in which he said that "No more than sail could compete with steam . . . can the conventional ships of the 'Fifties compete with the coming ships of the 'Sixties" (FLEET NEWS, Feb. 8, 1962). *In line with that idea the Maritime Administration awarded two contracts to develop proposals for integrated steam turbine power plants for marine propulsion. At a day-long meeting in Washington, Aug. 29, over 200 industry representatives heard and discussed the proposals. A brief resume of one of them, of which Newport News Shipbuilding and Dry Dock Co. was project manager, is presented below because it is more similar to machinery to be used in new vessels being considered for the Humble fleet.*—Ed.

The contract requirement of this study was to develop a design for an integrated steam turbine marine propulsion plant that would be safe and reliable and would reduce operating costs and minimize first costs. The plant studied has a rating of 20,000 shp., suitable for a C-4 cargo ship.

The power plant control system has been planned so that main engine control can easily be moved to the bridge if desired. However, for this study the entire main propulsion control remains in the engineroom.

With this automated plant, the engineroom crew per watch can be reduced to no more than two men, and by reducing the number and complexity of the plant components, first cost and maintenance costs are minimized.

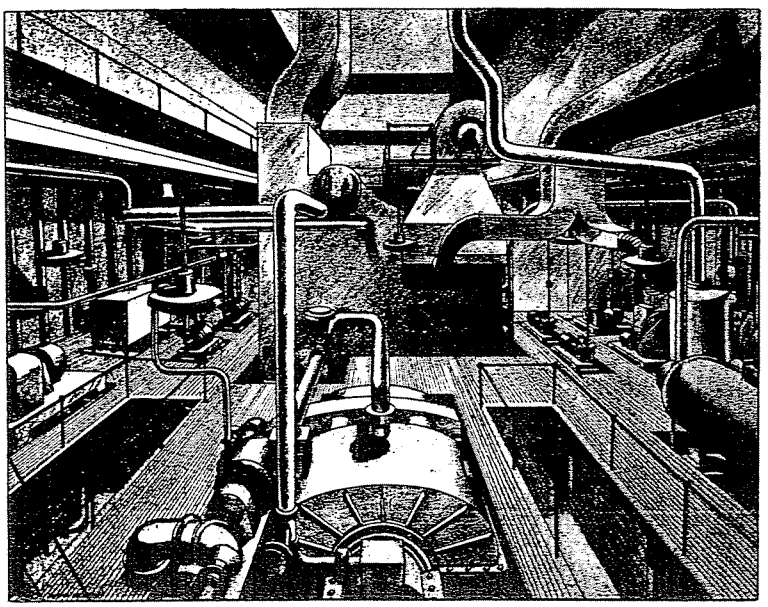
The main propulsion units consist of:

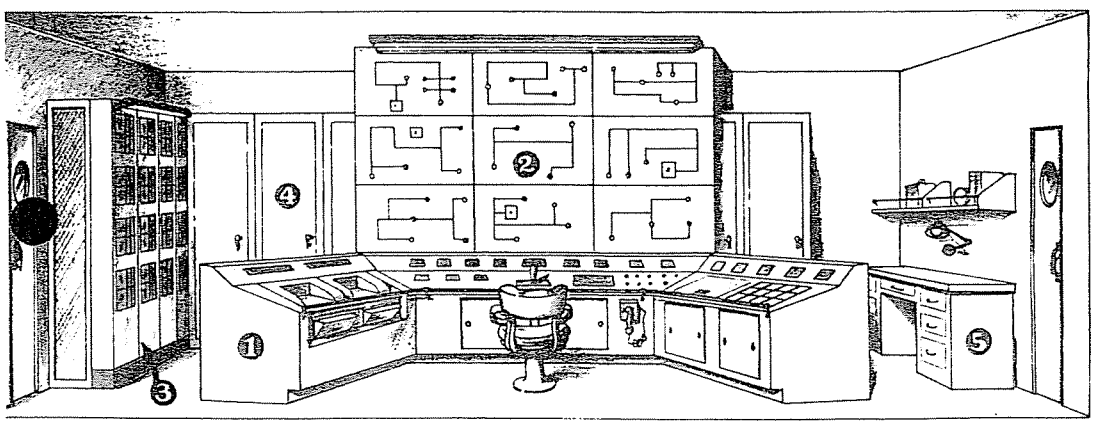
One bent-tube, two-drum, natural circulation boiler; steam at superheater outlet, 600 psig. and 865°F.

A non-extracting, single casing main turbine with astern elements. Since no steam is bled from the turbine, the possibility of losing vacuum while operating at low power or going astern is eliminated. Loss of vacuum is also minimized by having a minimum number of connections to the main condenser.

Lock-train reduction gear.

A gas turbine directly connectable to the main reduction gear for emergency propulsion





Sketch of engineroom as seen from engineer's operating station.

Control room showing 1. console, 2. diagrammatics with status lights, 3. electrical control panel, 4. solid state control cabinets and 5. log desk.

and also serving as the driver for a standby 750-kw. ship's service generator.

One 750-kw. non-condensing steam turbine driven ship's service generator.

One 75-kw. diesel emergency generator.

One contaminated steam evaporator.

One low pressure, two stage, flash-type distilling unit.

By improving boiler and auxiliary designs, a single boiler is considered justified. There is a larger drum to handle greater water level fluctuations, improved feed water treatment, automatic securing of boiler upon failure of auxiliary equipment and continuous steaming to minimize temperature changes on furnace walls and tubes.

Complete control and monitoring of the plant operation will be done from the operating station. However, complicated automatic control of auxiliaries is not proposed. A second man would do inspection and routine maintenance work such as cleaning strainers, bleeding down air flasks, draining settling tanks and transferring oil.

Control Systems

The basic plant control system is the "boiler-following" type, whereby the steam pressure indexes the firing rate so that the boiler follows up the load change. The throttle valve is positioned by the error signal between the ordered rpm. and the actual rpm. The combustion control signal is a function of the boiler steam flow and steam pressure. Ahead and astern throttles are inter-locked, in addition to being rate limited and pressure limited to prevent changing the steam flow rate too fast for the boiler to follow.

Proposed is a fully automated burner system that can insert and retract burners automatically as a function of load, or permit manual insert and retract from the operating station. The system includes continuous flame-scanning on each burner, automatic ignitors, air door operators, steam purging, light-off, securing and emergency shut-down mechanisms.

During all normal operation of the plant, including maneuvering, the only manual valve adjustment required is the RPM selector. Automatic pressure, temperature, or level regulating valves control plant conditions which would otherwise require constant or immediate operator attention.

Studies have been made into the best type of detecting aids to warn the watch engineer of pending trouble. Consideration was given to using television for monitoring the steering engine and boiler burner flame. Vibration pick-ups mounted on bearings of rotating equipment can be amplified and monitored. The monitoring device can either trigger an alarm or give an indication on a direct-reading meter, or do both.

About 125 points of temperature, pressure or level indication are proposed for automatic logging and alarming in the engineer's operating station. The points selected give the operator warning of pending trouble, aid in appraising the plant's overall operation, or in trouble-shooting.

It is estimated that at least $1 million can be saved over the life of a ship by the automated power plant, compared with standard C-4 machinery, due to lower first cost and lower operating costs.

Blessing in Disguise?

An article in the Aug. 13 issue of The Oil and Gas Journal bears the paradoxical title "Colonial Pipeline may HELP tankers". The big 36" line, now under construction and scheduled to start operating next year with a 600,000 bbls. per day thruput, generally is considered to be a threat to tankers — even a body blow.

The magazine points out that the pipeline will "force acceptance of automation, new designs and reduced crews which have been resisted by maritime unions". What this means is that the participating owners of the pipeline (which is to be a common carrier, by the way) are confident that they will be able to move oil from the Gulf to the East Coast cheaper than today's tanker rates. If this proves correct and tanker costs (and rates) are not reduced, the pipeline will certainly cut deeper and deeper into the movement of oil by water. However, if economies are made in the construction and operation of tankers, they may still beat the pipeline rates and thus be able to stay in business.

"It was the tanker industry's lag in adopting available technology to cut costs, while automation and (other) economies . . . steadily reduced pipeline rates, that helped to make Colonial possible," the article continued.

Another point brought out was that the pipeline may speed up harbor improvements to accommodate larger tankers. Even today there are many East Coast ports inaccessible to large vessels unless they shut out cargo or lighter into smaller vessels, both of which increase costs.

ESSO FLEET NEWS is published for the seagoing employees of the Marine Division, Humble Oil & Refining Co.: J. D. Rogers, General Manager; Joseph Andreae, Assistant General Manager; Sydney Wire, Assistant General Manager.

W. E. Gardner, Editor.

Contributions and suggestions are invited and should be addressed to The Editor, Esso Fleet News, Humble Oil & Refining Co., P. O. Box 1512, Houston 1, Texas.

A striking view of Honolulu sparkling in the sunlight with her mountains touching the clouds.

Esso Miami Completes Voyage to Hawaii

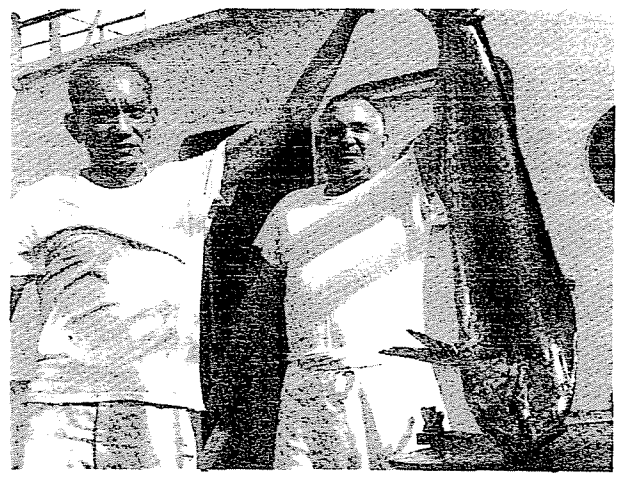
It was 42 days from the time the *Esso Miami* (Captain William N. Sims and Chief Engineer Max D. Petersen) left New York, July 14 until she was all fast at Baytown 10 min. before midnight, Aug. 25. Between those dates she had loaded at Aruba (July 19-21), transited the Panama Canal (July 23), discharged at Pearl Harbor and bunkered at Honolulu (Aug. 5-7) and transited the Canal again, Aug. 21.

Good weather was encountered over most of the 13,360 miles traversed, give or take a few, although on the return from Honolulu she passed through a hurricane-in-the-making. For days at a time no water was taken on deck and often not even spray.

Highlights of the trip, of course, were the Panama Canal transits and the 52½-hr. stay in our 50th state. Everyone was able to get ashore and Captain Sims and Chief Mate Robert J. Boxwell, who are licensed airplane pilots, chartered a plane for some aerial sightseeing.

Waikiki beach scene. You can't make it out very well but there are surfboard riders on the breakers and some of them may be *Esso Miami* crewmen. They found that it takes considerable skill to ride the waves, Hawaiian style.

Photos above by Wiper Lucio A. Oliveira



Bos'n Herve S. Gautier

UM Francisco Ravara and Chief Cook Augusto J. Senna hold a 30-lb. dolphin before fileting. Fish was caught in the Pacific by Pumpman Willard Mitchell while the *Miami's* speed was reduced during boiler washing.

Nursing Scholarships

The Teagle Foundation has announced that over 100 nursing scholarships have been awarded since the program was started a few months ago. Because of the overwhelming response, the Board of Directors of the Foundation have decided to limit future awards for nursing scholarships to tuition and fees, plus $25 monthly allowance for personal expenses but not exceeding $750 per year. Present scholarships will be carried to their indicated conclusion provided the students maintain satisfactory scholastic and personal conduct records.

Cornerstone Laid for Humble Building

The cornerstone for Humble's new 44-story headquarters building in Houston was laid Aug. 21 as Morgan J. Davis, Chairman of the Board, wielded an antique silver trowel. The ceremonies were presided over by Carl E. Reistle, Jr., President of the Company, and included remarks by Houston Mayor Lewis Cutrer and George Morse, president of the Houston Chamber of Commerce.

The first employees are scheduled to move into the building near the end of this month. The official opening will be held about the middle of December and occupancy completed early next year.

Some 3,500 employees, now working in 10 different locations throughout the city, will be brought together in the new building. Ten floors will be leased to other firms.

TAFFRAIL TALK

We had the *Esso Scranton* apparently flying from Bombay to Calcutta in the report of her India voyage last issue. She actually left the former port June 7 (instead of the 12th) for the 1,991-mile run to Calcutta, where she arrived June 13.

* * *

The NS *Savannah*, world's first nuclear powered merchant ship, received a gala welcome at her home port of Savannah, Ga. on Aug. 22. She is

scheduled to leave Norfolk mid-Sept. on a voyage to Seattle, where she will be a special attraction at the World's Fair from early October until the Fair closes. According to present plans she will next call at San Francisco and Los Angeles and then spend about two months at Galveston for general inspection and maintenance.

* * *

Charles H. Tyler, AB, ex *Esso Miami*, is proud to announce the birth of a son on Aug. 16. "Thomas Foster Tyler weighed in a 7 lbs., 5 oz. with a good set of lungs," Charlie said, "and as this is our first son after three daughters, you can see that we are doubly happy." He added that mother and son are doing fine but "I may never be the same again".

* * *

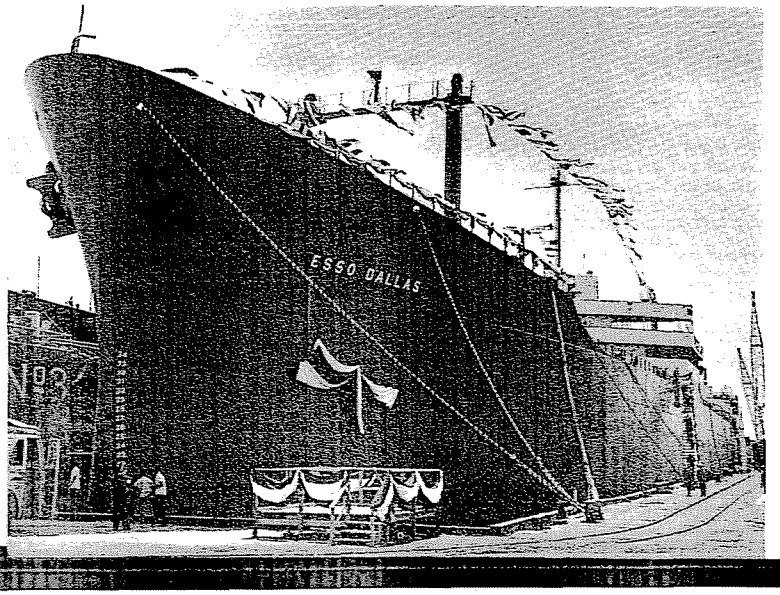
The *Esso Dallas* no sooner got a new name than she called at a new port — for a 27,000-tonner. On Sept. 3 she became the first of her class to discharge at Tiverton, R. I.

* * *

David F. Edwards, Manager of Humble's Employee Relations Department, made a voyage from Baytown to Everett in the *Esso Baltimore*, Aug. 23-29. He enjoyed the trip very much, in spite of Hurricane Alma, and was impressed with the thoroughness with which the men did their jobs.

Freshly painted and flag-decked, the *Esso Dallas* became the newest name in the Esso fleet after rechristening ceremonies were held at Todd's Galveston shipyard, Aug. 24. Formerly the *Esso Bermuda*, the vessel is the fourth in recent months to be renamed for cities which, Humble's Vice President Ray H. Horton said, "we feel are highly significant to the Company's operations". On Aug. 3 the *Esso Zurich* became *Esso Tampa* and previously the *Havana* and *Suez* were renamed *Esso Miami* and *Esso Jacksonville*, respectively.

City officials and business leaders from Dallas, Galveston and Houston attended the *Esso Dallas* event, along with representatives of the Company's Marine and Marketing divisions. The new name was unveiled by Walter Cousins, Mayor Protempore of Dallas.

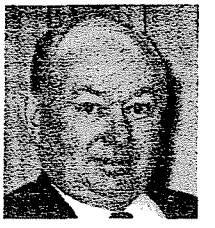


S. M. English, F. F. Newton in New Posts

On Aug. 27 Steve M. English was appointed Assistant Manager of the Operating Dept. and Fred F. Newton succeeded Mr. English as Assistant Manager of the Repair Dept. Both appointments are one year rotational training assignments.


Steve M. English

Of his 30 years in the Company, Mr. English sailed in the fleet for 14, advancing from Wiper to Chief Engineer. He came ashore in May 1948 as a Repair Inspector. He was also a Construction Inspector and Supervisor of Repairs before his promotion to Assistant Manager of the Repair Dept. four years ago.


Fred F. Newton

Mr. Newton, who has 33 years' service, was also a Chief Engineer in the fleet prior to becoming a Repair Inspector in New York in 1944. He spent 10 years in Galveston as Repair Inspector and Port Engineer for Humble, was made Supervising Port Engineer in March 1958 and later Asst. Marine Manager. From April 1961 until his present assignment, he was Sr. Asst. Port Engineer in the Port of New York Office.

OBITUARY

EUGENE HOLMAN, retired Chairman of the Board of Standard Oil Co. (N. J.), died in New York City, Aug 12. He was 67 years old.

Mr. Holman began his 41-year career with the Jersey company and its affiliates as a Geologist for Humble in March 1919. He became Chief Geologist and a Director of Humble before moving to New York in 1929 to be assistant to E. J. Sadler, then a Jersey Standard Vice President. Subsequently he served as President and Director of Creole Petroleum Corp. and Lago Petroleum Corp.

Named a Director of Jersey Standard in 1940, Mr. Holman was elected a Vice President in 1942 and a little later, a member of the Executive Committee. He took over the Presidency of the Company on June 12, 1944; became Chairman of the Executive Committee in Jan. 1946, and was elected Chairman of the Board on Jan. 1, 1954. He retired in May 1960.

Mr. Holman is survived by his wife; a son, Eugene, Jr.; a daughter, Mrs. Franklin P. Johnson and six grandchildren.