092565

B-136209
6-26-70

137

UNITED STATES GENERAL ACCOUNTING OFFICE

REPORT TO THE CONGRESS

Costs Of Operating The Nuclear Merchant Ship Savannah B-136209

Maritime Administration
Department of Commerce

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

JUNE 26, 1970

~~715088~~ 092565

B- 136209

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on costs of operating the nuclear merchant ship SAVANNAH-- Maritime Administration, Department of Commerce Our review was made pursuant to the Budget and Accounting Act, 1921 (31 U S.C 53), the Accounting and Auditing Act of 1950 (31 U.S C 67), and the Federal Property and Administrative Services Act of 1949 (41 U S.C. 254c)

Copies of this report are being sent to the Director, Bureau of the Budget, the Secretary of Commerce, and the Maritime Administrator

Elmer B. Staats

Comptroller General
of the United States

Contents

ABBREVIATIONS

AEC Atomic Energy Commission

FAST First Atomic Ship Transport, Inc.

GAO General Accounting Office

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

COSTS OF OPERATING THE NUCLEAR MERCHANT SHIP SAVANNAH
Maritime Administration
Department of Commerce
B-136209

D I G E S T

WHY THE REVIEW WAS MADE

Because of congressional interest in the Government's entry into experimental commercial operation of a nuclear merchant ship--an unprecedented area--the General Accounting Office (GAO) has reviewed the administration of contracts for operating and servicing the nuclear ship SAVANNAH.

The ship is a prototype designed to demonstrate one way to use atomic power for peaceful purposes as well as to test the practicability of such use for commercial ships.

FINDINGS AND CONCLUSIONS

The Maritime Administration is responsible for administering these contracts. Maritime, without benefit or guidance from prior experience, was faced with the problem of drawing up contracts under which practical working arrangements could be developed satisfactory to all parties operating in a novel, untested field.

The SAVANNAH was chartered to First Atomic Ship Transport, Inc., a wholly owned subsidiary of American Export Isbrandtsen Lines, Inc , and began commercial operations on regular cargo trade routes in August 1965. Maritime previously had signed a long-term service contract with Todd Shipyards Corporation.

From August 20, 1965, through June 30, 1969, Maritime's net cost of operating, servicing, and refueling the SAVANNAH was about $12.6 million, excluding ship depreciation, nuclear fuel cost, and Maritime's administrative costs. The ship has been refueled once.

The cost over revenues (net cost) to operate the SAVANNAH has averaged about $2.9 million annually. This is about $2 million more a year than the average operating subsidy paid for comparable conventional-fuel ships operated on the same trade route. (See p. 12.)

About $1.9 million of the SAVANNAH's additional annual costs is attributable to:

--$300,000 average annual cost for nuclear crew training,

--$409,000 average annual cost for a specially trained nuclear shore staff, and

--$1,162,000 average annual cost for a nuclear ship-servicing facility. (See pp 12, 14, and 15)

The special crew training has produced a reserve of personnel trained and licensed to operate a nuclear vessel. The cost of training crews to operate future nuclear ships should be reduced to the extent that presently trained crewmen are available. (See p 14.)

The shore staff and the maintenance facility could handle several nuclear ships at a lower cost per ship. For example, Maritime and contractor officials believe that the servicing facility could easily service 10 nuclear vessels on the basis of a 2-1/2-year core life for each vessel reactor. (See p 16)

The training, shore staff, and servicing facility will continue to contribute significantly to the high cost of operating the SAVANNAH as long as one vessel must absorb the full cost. (See p. 16.)

On contract administration, GAO made the following observations.

Because of the small amount of claims paid by the underwriter compared with the premiums paid for the protection and indemnity insurance carried on the SAVANNAH, it would be more economical for Maritime to adopt the policy of self-insurance. (See p. 17.)

Maritime paid an allowance for the overhead of American Export Isbrandtsen Lines, Inc , based on a proration of the prior year's administrative and general expenses of the firm's freight fleet

Maritime's auditors noted several overhead items which they believed, under the terms of the agreement, should have been excluded in negotiating the overhead allowance However, the agreement provided that the allowance not be subject to adjustment during the operating year. Further, Maritime did not exclude these costs in negotiating the overhead allowance for the second and third operating years even though informed of the auditors' findings. (See p. 22.)

The method of compensating the operator for overhead expenses was revised beginning with the fourth operating year. Maritime now pays, for both overhead and profit, an amount based on a negotiated percentage of the gross revenues earned by the SAVANNAH. (See p. 24.)

RECOMMENDATIONS OR SUGGESTIONS

The Maritime Administrator should discontinue requiring the operator to carry insurance covering marine protection and indemnity risks for the SAVANNAH and should adopt a policy of self-insurance. (See p. 21.)

In determining the operator's profit and overhead allowance in future years, the contracting officer should be required to determine through a preaudit of the general and administrative expenses of American Export Isbrandtsen Lines, Inc. (1) the cost elements allocable to the SAVANNAH and (2) the reasonableness of the percentage to be applied to gross revenue in relation to the results disclosed by the preaudit. (See p. 27.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

The Maritime Administrator states that, when the experimental commercial operation was being planned, it was Maritime's desire to duplicate, as far as possible, the commercial shipping environment. Therefore, the operator was required to carry the insurance. Since operation of the SAVANNAH has demonstrated the ready availability of commercial protection and indemnity insurance for nuclear merchant ships, Maritime intends to adopt the policy of self-insurance beginning with fiscal year 1971. (See p. 21.)

Maritime states that it adopted the initial method of computing the overhead allowance after considering conditions existing at the time negotiations were in progress, i.e., its negotiating position and the lack of any prior factual experience upon which to base the true overhead cost requirements. Thus, the method was considered reasonable by Maritime. Maritime also considers that the current method of compensating the operator for overhead expenses is acceptable and that the use of the negotiated percentage of gross revenue to compensate the operator eliminates the need for a preaudit of overhead expenses. (See p. 24.)

GAO believes that a preaudit is still required, however, to determine whether the overhead and profit factors on which the negotiated percentage is computed are appropriate. (See p. 26.)

MATTERS FOR CONSIDERATION BY THE CONGRESS

Data contained in the report may be of interest to the Congress in its deliberations on whether to continue to operate or to lay up the vessel as proposed in the President's fiscal year 1971 budget.

CHAPTER 1

INTRODUCTION

The General Accounting Office has reviewed selected aspects of the contracts awarded by the Maritime Administration, Department of Commerce, for the experimental commercial operation and servicing of the nuclear ship SAVANNAH. Our review was directed primarily toward Maritime's contract administration practices for the SAVANNAH's commercial operation from August 1965 through August 1968. We also reviewed certain costs related to the nuclear characteristics of the vessel, such as those for shore staff and technical facilities. We did not review the effectiveness of the experimental commercial operation of the SAVANNAH. The scope of our review is described on page 28.

The contracts for the vessel's commercial operation and servicing are administered by Maritime's Office of Nuclear Programs. A chart showing the organizational arrangements and responsibilities for operating and servicing the SAVANNAH is included as appendix II. A list of the principal officials responsible for the administration of the activities discussed in this report is included as appendix III.

We previously reported on the construction and outfitting of the SAVANNAH and on the selection of the contract operator for the demonstration phase of operation in our report to the Congress entitled "Deficient Administration of Spare Parts Procurement and Other Deficiencies in Contract Administration Relating to the Nuclear-Powered Merchant Vessel 'NS SAVANNAH'" (B-136209, April 12, 1965).

Completed in 1962, the SAVANNAH was built by the United States Government as a prototype vessel designed to demonstrate to the world the sincere desire of the United States to use atomic power for peaceful purposes, and to determine the practicability of applying nuclear energy to the operation of commercial cargo and passenger vessels. A picture of the SAVANNAH provided by Maritime is shown on page 11.

The SAVANNAH is 595.5 feet in length, has a beam of 78 feet, and has a design speed of 21 knots. The 15,585-gross-ton vessel has seven cargo holds which can accommodate 8,498 tons of freight in the approximately 652,010 cubic feet of cargo space. The SAVANNAH was constructed as a combination passenger-cargo ship and, in addition to its cargo space, has 30 staterooms which can accommodate 60 passengers. Other features include a passenger dining room, a public lounge and lobby, a veranda, and a swimming pool. The passenger facilities have not been utilized during the experimental commercial phase of the vessel's operation because the cost of operating the facilities would be greater than the revenue received from passenger service.

During the demonstration phase of operation, from March 1962 to August 1965, the vessel sailed about 90,000 miles and visited 55 domestic and foreign ports. During this phase, the vessel established an internationally accepted pattern of marine operations for nuclear commercial ships of the future.

After the successful completion of the demonstration phase of the vessel's operation, Maritime initiated the experimental commercial phase to (1) develop a routine operation and prepare the world's maritime community for acceptance of nuclear-powered cargo vessels in commercial service, (2) convince the shipping industry that it could successfully operate a nuclear ship in the commercial environment, (3) establish operational data on the reliability and safety of nuclear ships for use in planning for advanced nuclear-powered cargo vessel designs of the future, and (4) provide a nucleus of trained personnel for key positions aboard any future nuclear vessels and for shore support of such vessels.

In August 1965 Maritime entered into a "bareboat" charter agreement with First Atomic Ship Transport, Inc. (FAST), a wholly owned subsidiary of American Export Isbrandtsen Lines, Inc. (American Export), for the commercial operation of the SAVANNAH. Previously the Atomic Energy Commission (AEC) had issued a 3-year operating license--the first for nuclear-powered merchant vessels--to FAST for the operation of the vessel's reactor. No nuclear reactor may be operated within the United States without such a license or authorization by AEC, or without specific congressional authorization.

The bareboat charter provided for the payment by FAST of one dollar per year for the charter hire of the SAVANNAH. This charter, a standard contractual document used by Maritime, authorizes ship operators to operate Government-owned vessels in a manner virtually identical to the way they would operate privately owned vessels. The charter agreement is subject to review by Maritime each year to ascertain whether the existing conditions, such as current operating costs, justify the continuance of the charter. Maritime had previously entered into a long-term cost-plus-fixed-fee contract with Todd Shipyards Corporation (Todd) for the servicing of the vessel. (See p. 9.)

During the 3 years of commercial operation covered by our review, the vessel's operations were integrated into the regular cargo operations of the American Export fleet and the vessel made 19 voyages, sailing about 240,000 miles. The voyages, made on trade routes from U.S. Atlantic ports, included 10 trips to the Mediterranean, seven to northern Europe, and two to the Far East. Seven voyages were completed during each of the first 2 years and five voyages were completed during the third year.

The following table shows the cost of operating and servicing the SAVANNAH for each of the first 3 years of its commercial operation--as presented by Maritime in its technical, operational, and economic report for each year of operation--and does not include Maritime administrative costs, depreciation of the SAVANNAH, or nuclear fuel cost.

	1st year	2d year	3d year
Operating costs:			
Voyage expenses	$1,859,283	$1,948,090	$1,919,613
Port charges	410,317	402,001	445,086
Cargo handling	797,441	902,095	1,122,481
Total operating costs	3,067,041	3,252,186	3,487,180
Less voyage revenue	2,351,702	2,614,421	2,737,530
Net operating loss	715,339	637,765	749,650
Allowance for American Export overhead	197,100	215,715	233,600
FAST compensation	200,000	173,260	37,478
Nuclear shore staff	305,409	441,780	480,000[a]
Total paid to FAST	1,417,848	1,468,520	1,500,728
Nuclear servicing facility--Todd (note a)	1,011,800	966,500	1,509,000
Training programs (note a)	282,000	285,000	330,600
Total net cost of operating and servicing	$2,711,648	$2,720,020	$3,340,328

[a]Estimated amounts

The operating and servicing costs for the fourth year would not be comparable to the costs in the preceding schedule because (1) from the beginning of the operating year on August 20 through October 1968 the vessel was being refueled, (2) there was a 113-day longshoremen's strike during the year, and (3) the operating year was changed to end on June 30; thus the fourth operating year was actually only about 10 months. However, the net cost for this period, including refueling, is estimated to have been $3.8 million. During the first 4 years of experimental commercial operation, from August 20, 1965, through June 30, 1969, Maritime's net cost of operating, servicing, and refueling the SAVANNAH was about $12.6 million.

The operating costs of the SAVANNAH are higher than costs of comparable conventionally powered vessels primarily because of the vessel's larger crew (67 compared with about 46 to 55 for comparable conventionally powered vessels) and of the higher costs of supplies and maintenance.

Comments on the provisions of the contracts with FAST and Todd follow.

FIRST ATOMIC SHIP TRANSPORT, INC.

On August 20, 1965, Maritime and FAST entered into a bareboat charter agreement for the experimental commercial operation of the SAVANNAH for the 3 years ending August 19, 1968. Five amendments had been added to the contract as of June 30, 1969. The first two amendments provided for financing the operation of the vessel for the second and third operating years. The third amendment provided for refueling in August through October 1968 and extended the period of operation until the fuel is exhausted or until June 30, 1971, whichever is earlier. The last two amendments provided for the compensation to FAST for the fourth and fifth periods of operation from about November 1, 1968, to June 30, 1970. In October 1968, the annual operating period was changed from a year ending on August 19 to the Federal fiscal year which ends June 30.

The agreement for the first 3 years of commercial operation of the SAVANNAH provided for Maritime to reimburse FAST for the vessel's net operating loss; the expenses of the nuclear shore staff, subject to a maximum allowance; and American Export's overhead expenses based on a proration of American Export's freight fleet overhead expenses.

The agreement also provided that compensation to FAST be based on an incentive feature which specified that, if the annual vessel operating loss was less than a previously agreed amount, a "profit" would result which would be shared equally by FAST and Maritime up to a maximum of $200,000 for FAST and that any profit above $400,000 would go to Maritime. Conversely, if the operating loss was greater than estimated, a "loss" would result. Losses up to $200,000 would be shared equally by FAST and Maritime, in excess of $200,000 and up to $600,000 would be shared one fourth by FAST and three fourths by Maritime, and in excess of $600,000 would be borne by Maritime. The method of compensating FAST for operating the vessel and for American Export's overhead was changed for the fourth and fifth operating years (See p. 24).

TODD SHIPYARDS CORPORATION

On April 29, 1960, Maritime entered into a 5-year cost-plus-fixed-fee contract with Todd for the maintenance, modification, and servicing of the SAVANNAH. On May 15, 1962, Maritime extended the contract to May 15, 1967, and on March 13, 1967, extended the contract to May 15, 1972.

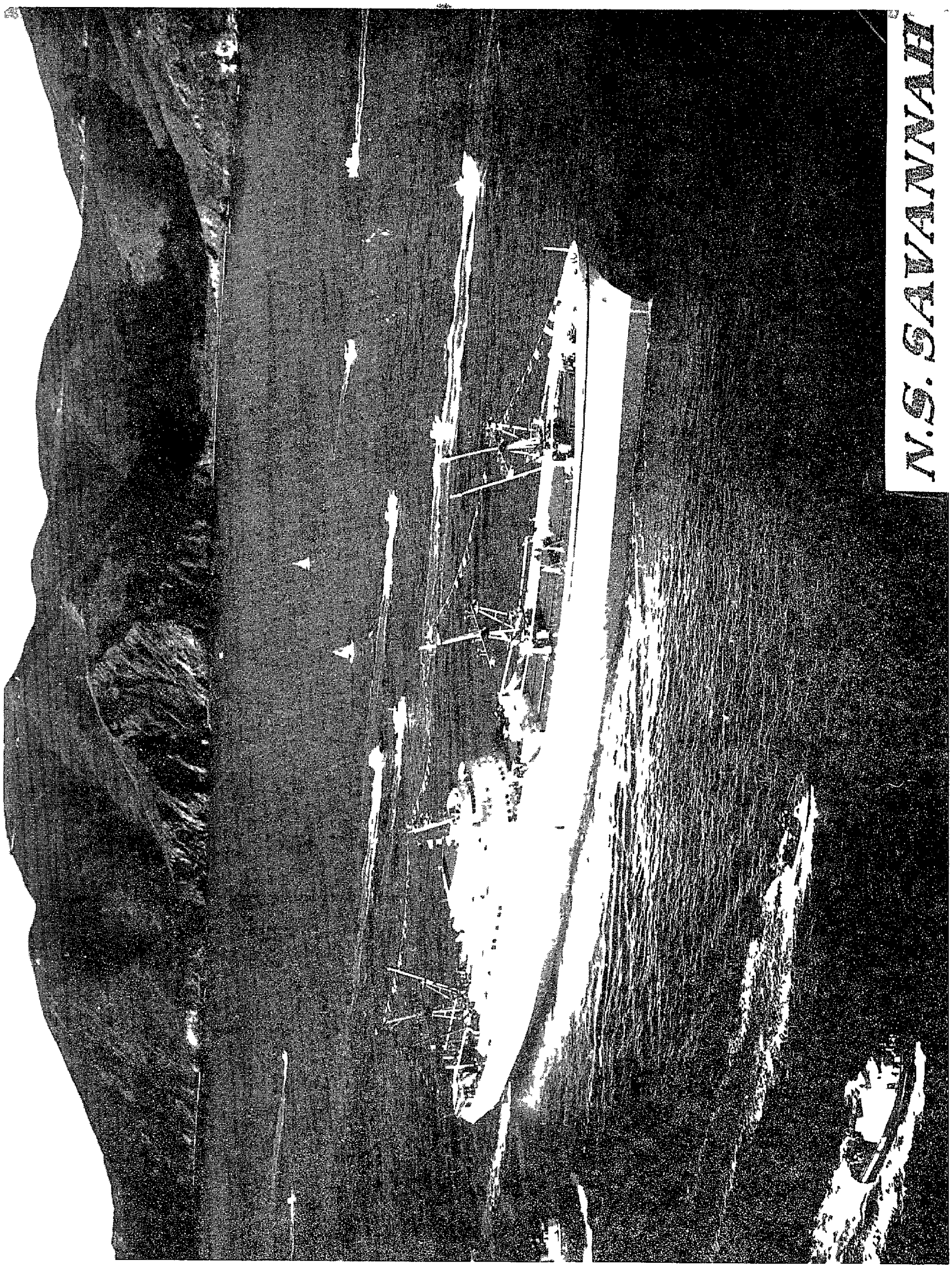
Pursuant to the contract provisions, the Nuclear Division of Todd has constructed, maintained, and operated a nuclear servicing facility at Galveston, Texas. The servicing facility consists of Todd's repair yard and facilities and special Maritime facilities constructed to perform refueling and major nuclear repairs, as well as normal maintenance, with respect to both the conventional and the nonconventional features of the vessel.

The contract provides for Todd to be paid (1) a rental allowance for its land and facilities, (2) the actual cost of work performed under the contract, plus a fixed fee of 5 percent of the estimated cost of the work, and (3) the indirect or overhead expenses allocable to the work.

- - - -

The contractual arrangements relating to the SAVANNAH, its operation, and servicing represent the entry by the Government into a novel, unprecedented, and untested area--that of the nuclear merchant ship and its experimental commercial operation. Thus, without the benefit of any prior experience or precedents, it was necessary for Maritime to initiate bases upon which to develop a practical working arrangement satisfactory to all parties. In addition, many problems, including labor difficulties, existed in connection with obtaining a responsible commercial operator for the vessel.

Recognizing the experimental nature of the program and the problems encountered, we nevertheless believe that the administration of certain aspects of the bareboat charter agreement with FAST could be improved to achieve greater economies in the operations financed by the Government. Maritime Administration, FAST, and Todd were offered an opportunity to comment on a draft of this report. The Maritime comments are included as appendix I; FAST had no comments; and the Todd comments were not relevent to matters discussed in this report.


N.S. SAVANNAH

CHAPTER 2

TRAINING, SERVICING FACILITY, AND SHORE STAFF

CONTRIBUTE TO HIGH COST OF OPERATION

For the first 3 years of its commercial operation, the SAVANNAH program has cost Maritime an average of about $2.9 million a year, excluding Maritime administrative expenses, depreciation of the SAVANNAH, and nuclear fuel costs. About $1 million of the $2.9 million has been vessel operating cost. Although this $2.9 million is about $2 million more than the average amount of operating subsidy[1] paid by Maritime for comparable conventional-fuel vessels operating on the same trade route as the SAVANNAH, an average of about $1.9 million of this additional cost is a result of nuclear training, a nuclear shore staff, and a nuclear servicing facility. The entire cost of these special programs and facilities must be borne by the SAVANNAH as a "one ship system." The training programs, shore staff, and servicing facility are discussed in the following sections.

TRAINING PROGRAMS

The charter agreement with FAST specifies that Maritime is to provide, direct, and finance the training of crew necessary to meet vessel manning requirements caused by crew attrition and to maintain a pool of shipboard personnel trained and experienced in nuclear procedures. This training has been carried out at the U.S. Merchant Marine Academy, aboard ship, and at a Department of the Army school at Fort Belvoir, Virginia. It has consisted of

---

[1]Because it costs more to operate American-flag vessels in competition with foreign-flag vessels, Maritime pays as a subsidy the difference between the American-flag cost and the foreign-flag cost with respect to (1) wages, (2) subsistence, (3) maintenance and repairs, (4) hull and machinery insurance, and (5) protection and indemnity insurance, to those operators which agree to provide a stipulated number of sailings on specified trade routes.

training related to reactor operation, nuclear instrumentation, nuclear water chemistry, and health physics. Of the 67-man crew, 27 are required to have at least some of this training. As no additional nuclear merchant vessels have been built, this training has continued to expand the pool of trained and experienced manpower available for manning any future American-flag nuclear ships.

The reactor operator training consists of 4 to 5 months of academic training at the U.S. Merchant Marine Academy, followed by 4 to 5 months of shipboard training. The courses of instruction provide the participants with a background in nuclear science; a detailed knowledge of the vessel's simulator; and an understanding of the behavior and control of the reactor system and the steam plant system. The shipboard phase of training consists of a review of academic subjects, familiarization with shipboard arrangements, and operational practice. By June 30, 1969, there were 88 officers and engineers who had completed reactor operator training under this program, had taken the AEC-administered reactor operators' examination, and had received licenses from the AEC. Of these, 35 had been trained during the first 3 years of commercial operation.

The nuclear instrumentation training is received at the Army's school at Fort Belvoir. This training is for a period of about 8 months and qualifies the men as Instrumentation/Electronic Officers to analyze, service, and maintain the nuclear and nonnuclear instrumentation aboard the SAVANNAH. By June 30, 1969, 14 operators had been qualified in nuclear instrumentation.

The nuclear water-chemistry training is conducted by Bull & Roberts, Inc., at the U.S. Merchant Marine Academy and aboard ship. At present final instruction is conducted by qualified FAST engineers and qualification testing is conducted by Bull & Roberts, Inc. At June 30, 1969, 44 men had been instructed, examined, and certified in the methods and procedures for maintaining within specifications the nuclear vessel's primary coolant water chemistry.

The health physics training is given aboard ship by FAST with the assistance of Todd instructors. As of June 30, 1969, 50 engineers and deck officers had received training in radiation control and environmental safety procedures for personnel engaged in activities near reactor operations.

This special crew training, which cost Maritime an average of almost $300,000 a year during the first 3 years of commercial operation, has produced a reservoir of marine personnel trained and licensed to operate a seagoing nuclear power plant. We believe that the training already provided under the SAVANNAH program should reduce the cost of training crews to operate future nuclear merchant vessels to the extent that these crewmen are available to man any such vessels.

NUCLEAR SHORE STAFF

A shore staff has been required for the administration of the vessel's operation because, as the first nuclear-powered merchant vessel, the SAVANNAH required close surveillance to protect the safety and health of the crew and port communities visited. Also, port surveys, arrangements for the vessel's entry and departure in foreign and domestic ports, and annual inspections require more work and planning than the operation of a conventional ship does.

The staff, consisting of about 10 members supervised by the Executive Vice President of FAST, is responsible for the various programs for ship operation, safety, technical matters, and port planning. Counsel is available to provide legal assistance in matters such as the development of port entry arrangements with foreign governments in cooperation with Maritime, AEC, and the Department of State.

Under the terms of the charter agreement, Maritime reimburses FAST for its actual expenses incurred in the employment of the shore staff, overhead attributable to the staff, research and tests, security, standby tugs, and contractor services which are required because of the nuclear characteristics of the vessel. To control these expenses, which average about $409,000 annually, the agreement contains a maximum limitation on shore staff expenditures, which has never been exceeded. Maritime officials informed us that, although there might be some increase in the total cost of the nuclear shore staff, the cost per vessel would be less if the SAVANNAH were not the only nuclear vessel managed by the staff.

NUCLEAR SERVICING FACILITY

The nuclear servicing facility at Galveston, Texas, has been constructed and operated by Todd to furnish material and services for the maintenance, refueling, and servicing of the SAVANNAH and to furnish a home base for the vessel. Todd has furnished a land area of about 1-1/2 acres, a pier and platform area to berth the vessel, and office space for the technical staff. Todd has also provided about 25 acres of land adjacent to the servicing facility for use as an exclusion zone to ensure public safety. Operation of this facility has cost Maritime an average of about $1,162,000 annually during the first 3 years of commercial operation.

The maintenance building--which is used for maintenance, modification, and refueling of the vessel and for carrying out testing and development programs--and most of the equipment at the servicing facility are owned by Maritime. In addition, Maritime provides such items as supplies, spare parts, and a spare reactor core. The Government's investment at the facility as of December 1969 totaled about $3.3 million. The assets include (1) a servicing barge (the Atomic Servant), (2) a 75-ton gantry crane, and (3) the maintenance building which contains a 75-ton bridge crane, a water-filled spent-fuel pit with purification and cooling system, a decontamination room, a reactor mock-up vessel, an instrumentation workshop, an emergency power generator, and special refueling gear.

Todd was also required by the contract to establish and maintain the SAVANNAH Technical Staff which is an organization of nuclear and marine engineers supported by a select corps of draftsmen, specialists, technicians, mechanics, and skilled workmen, including those with health physics and nuclear safeguard capability. The staff provides engineering support, updates drawings, and makes ship repairs. The main task during fiscal year 1968 and part of 1969 was the preparation for the first refueling of the vessel which began in August and was completed in October 1968. The refueling was done at the servicing facility under a contract entered into by FAST and Todd with SAFE, Incorporated, a Texas corporation organized by FAST and Todd for the sole purpose of accomplishing the refueling.

During the first year of commercial operation, the annual Coast Guard inspection was made at the servicing facility from June 2 to July 1, 1966. The second and third annual inspections were made at Todd's shipyards in New York in April 1967 and March 1968. Trained personnel from the nuclear facility traveled to New York to supervise and assist in these annual inspections. The vessel did not return to the servicing facility until August 1968, after an absence of 2 years.

On the basis of its usage to date, we conclude that the facility could service several nuclear vessels. The manager of Todd's Nuclear Division and Maritime officials stated that the facility could easily service 10 nuclear vessels based on a 2-1/2-year core life for each vessel reactor. The SAVANNAH was operated about 6 years before it was refueled. A Maritime official informed us that, without the need of any major repairs, the SAVANNAH would not have to return to the servicing facility for about 2-1/2 to 3 years, at which time the vessel would be refueled.

- - - -

We conclude that the support facilities and training will continue to contribute to the high cost of operating the SAVANNAH as long as the SAVANNAH operation absorbs the full cost of the nuclear training programs, the shore staff, and the servicing facility.

CHAPTER 3

SAVINGS AVAILABLE BY DISCONTINUING THE PURCHASE OF PROTECTION AND INDEMNITY INSURANCE

Because of the small amount of claims paid by the underwriter compared with the premiums paid for the protection and indemnity insurance carried on the SAVANNAH, we believe that it would be more economical for Maritime to adopt the policy of self-insurance. We estimate that savings would amount to as much as $73,500 annually. The estimate of savings does not include a reduction for pending but unsettled claims which may result in payments by the underwriter, nor does it include savings resulting from the Treasury Department's reduced need for borrowed funds.

In our opinion the discontinuance of protection and indemnity insurance would not be detrimental to the Government because (1) claims have not been large, (2) Maritime is already liable for damage to the vessel's hull and machinery, and (3) AEC is liable for damages arising from any nuclear incident under the indemnification provisions of the Atomic Energy Act of 1954, as amended.

Our review of the premium costs and claims relating to the protection and indemnity insurance purchased by FAST and reimbursed by Maritime, to cover both FAST and Maritime, indicated that elimination of the requirement that FAST purchase this coverage could result in significant savings to Maritime. The premium costs for protection and indemnity insurance covering illness or injury, cargo claims, and accidents were about $368,800 from August 20, 1965, through February 19, 1970, compared with only $37,750 in claims paid by the underwriter from August 1965 through November 1969.

The bareboat charter agreement requires that FAST carry insurance covering marine protection and indemnity risks in the amount of $25 million, in such forms and with such insurance companies as Maritime shall require and approve. The required insurance was obtained by FAST through an association insurance plan which covers about 1,300 ships operated by various private shipping companies. Under this plan, the underwriter sets premium rates for each ship based on losses incurred on all ships participating in the plan.

FAST obtained two insurance policies with the underwriter: (1) a basic policy providing for a limit of liability of $2.5 million for each accident or occurrence and (2) another policy for coverage in excess of $2.5 million and up to $25 million for any one accident or occurrence. The protection and indemnity insurance policies provide indemnification for damage caused by the vessel and protection for illness and injury to personnel and damage to cargo. Liability arising from nuclear incidents and from damage to the ship is excluded from coverage. The basic policy also contains a deductible clause which relieves the underwriter of any liability for the first $6,000 to $10,000 of all claims regarding general cargoes on each round-trip voyage, depending upon the trade route, and for the first $2,500 of all claims regarding illness at any one port or injury claims for any one accident or occurrence.

The premiums for the basic coverage are paid in an advance payment and a supplemental payment. The supplemental payment is computed approximately 3 years after the policy year on the basis of the underwriter's loss experience for the policy year. The premiums for the coverage in excess of $2.5 million are on a flat-rate basis, are paid in two installments during the policy year, and are not subject to adjustment. The estimated costs incurred by FAST for the protection and indemnity insurance from August 20, 1965, through February 19, 1970, are shown below.

Policy period	Advance premium	Estimated supplemental premium	Premium for coverage in excess of $2.5 million	Total estimated premium
8-20-65 to 2-19-66	$ 12,394	$ 24,203[a]	$ 6,621	$ 43,218[a]
2-20-66 to 2-19-67	29,493	29,923	13,063	72,479
2-20-67 to 2-19-68	34,715	31,419	13,062	79,196
2-20-68 to 2-19-69	46,130	23,544	13,063	82,737
2-20-69 to 2-19-70	57,546	19,637	14,012	91,195
Total	$180,278	$128,726	$59,821	$368,825

[a]Actual

Our review of all the claims paid from August 20, 1965, to November 20, 1969, showed that about 80 percent were less than the deductible amount and therefore were paid by FAST. The claims paid by FAST amounted to $165,764 during this period, whereas claims paid by the underwriter amounted to only $37,750.

In accordance with the bareboat charter agreement, the claims paid by FAST and the premiums paid to the underwriter are considered voyage operating expenses. The type and amount of claims paid for the period August 20, 1965, to November 20, 1969, and pending as of November 20, 1969, are summarized below. The claims paid by FAST include legal expenses incurred.

Type of claim	Claims paid By FAST	Claims paid By underwriter	Claims pending (reserved by underwriter)
Illness and injury	$ 59,760	$37,750	$23,750
Cargo	106,004	-	58,647
Total	$165,764	$37,750	$82,397

As noted in the preceding schedule, the underwriter has reserved $82,397 for pending claims. The reserve represents the amount by which claims received but not yet settled exceed the applicable deductible amounts. On the basis of past claim settlements, it appears that the underwriter's liability will be significantly reduced. To the extent that the reserved amounts do result in the payment of claims by the underwriter, however, our estimate of annual savings would be reduced.

Because of the relatively small amount of claims paid by the underwriter during the above period compared with the premiums paid, it does not appear that the cost of carrying the protection and indemnity insurance is justified. On the basis of Maritime's past experience with the insurance carried on the SAVANNAH, we believe that the risk to the Government of guaranteeing all illness, injury, and cargo claims now covered under insurance policies would be minimal.

We have been informed by representatives of American Export that its insurance division handles all claims against the vessel, including those that are recoverable from the underwriter. The underwriter takes no part in the processing and settlement of the claims except when legal action is required. American Export, however, keeps the underwriter informed of all claims which might be in excess of the deductibles, and the underwriter's approval is necessary prior to American Export's taking any legal action in the settlement of a claim.

American Export's claim adjusters first attempt to settle all claims. If a settlement cannot be reached with the claimant, the claim is referred to one of the two law firms which represent American Export, depending on whether the claim is for cargo or for illness or injury. Since all the administrative and legal expenses are now paid by FAST and reimbursed by Maritime, we believe that under a self-insurance plan no additional expense for handling claims would be incurred.

The SAVANNAH is covered for any nuclear incident by the indemnification provisions of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2210(1)). The act provides indemnification up to an aggregate of $500 million for one nuclear incident. Maritime assumes all losses and liability with respect to marine hull, war-risk hull, and war-risk protection and indemnity insurance.

CONCLUSION

By requiring FAST to carry insurance for cargo and illness or injury claims, Maritime incurred about $369,000 in premium costs, compared with only about $38,000 in claims paid by the underwriter during the period August 20, 1965, through February 19, 1970. Maritime should assume the risk for the protection and indemnity insurance on the SAVANNAH because (1) the premiums have exceeded claims paid, (2) FAST has paid about 80 percent of the claims because of the deductible clause, and (3) Maritime has demonstrated the availability of commercial protection and indemnity insurance. On the basis of premiums paid during this period and the amount of claims paid by the underwriter, we estimate that, by adopting the policy of self-insurance for protection and indemnity risks, Maritime could achieve future savings of as much as $73,500 annually.

It is an established policy in many programs for the Government to assume its own risks of loss. The policy of self-insurance is based on the theory that, because of the magnitude of the Government's resources, it is less costly for the Government to assume its own risks than to insure them through private insurers at rates sufficient to cover all losses and operating expenses, including broker and agency commissions and profits of the insurers.

RECOMMENDATION

We therefore recommend that the Maritime Administrator take action to discontinue the practice of requiring FAST, the ship operator, to carry insurance covering marine protection and indemnity risks for the SAVANNAH and to adopt a policy of self-insurance against such risks.

AGENCY COMMENTS AND ACTION TAKEN

In a letter dated February 13, 1970, commenting on a draft of this report (see app. I), the Maritime Administrator states that, when the period of experimental commercial operation was being planned, it was Maritime's desire to duplicate as far as possible the commercial shipping environment. Therefore, FAST was required to carry protection and indemnity insurance on the vessel. He informs us that, since the SAVANNAH operation has now demonstrated the ready availability of commercial protection and indemnity insurance for nuclear merchant vessels, Maritime intends to adopt our recommendation and, beginning in fiscal year 1971, will assume the risks currently insured through an underwriter.

CHAPTER 4

NEED FOR DETERMINATION OF ALLOWABLE OVERHEAD EXPENSES

Maritime should have required a preaudit of American Export's overhead expenses prior to negotiating American Export's overhead allowance, to assure itself that the allowance covered only items of expense properly chargeable under the terms of the charter agreement or applicable to the SAVANNAH's operations. Maritime's charter agreement with FAST provided that, during each of the first 3 operating years, Maritime would pay an agreed allowance for American Export's overhead expenses based on a proration of American Export's preceding year's administrative and general expenses allocable to the firm's freight fleet and allowable under American Export's operating subsidy agreement with Maritime. The amount of the first year's overhead allowance was specified in the original agreement and the amounts for the second and third years were added by amendments to the original agreement.

During the audit for the first operating year, external auditors of Maritime's Atlantic Coast District (now Eastern Region) noted several items of expense which they believed should have been excluded in establishing the overhead allowance. The auditors could not take exception to the overhead items because the agreement provided that the overhead allowance negotiated at the beginning of the operating year be a fixed amount and not be subject to final audit.

Included in expenses which the external auditors believed should have been excluded were (1) salaries for personal services in excess of $25,000 per annum, (2) management and operating commissions on sales of passenger tickets, (3) advertising for passengers to be carried on the cargo ships, and (4) foreign income taxes at ports, primarily in India, which were not included in SAVANNAH's itinerary. Salaries in excess of $25,000 were questioned by the auditors because Maritime's operating subsidy agreements contain "recapture" provisions which provide, in accordance with the Merchant Marine Act of 1936 (46 U.S.C. 1223(c)), that such salaries are not an allowable expense. The commissions on the sale of passenger tickets, advertising for passengers, and foreign income taxes were questioned because the SAVANNAH does not carry passengers nor does its itinerary include ports where foreign income taxes are paid. Elimination of these items would have reduced the American Export overhead allowance for the first operating year by about $13,000.

The auditors also noted that the same expense items were included in the overhead allowance for the second operating year. The Office of Nuclear Programs had not reviewed the items of expense constituting the American Export overhead, and the overhead allowance was approved as submitted by American Export. A Maritime official informed us that the allowance was considered reasonable and therefore no review was made.

To determine the validity of the expense items questioned by the external auditors, we reviewed American Export records of the overhead computation. We concluded that the bases for questioning these expense items were valid because the expenses either were not allowable under the agreement or were not directly applicable to SAVANNAH's operations and, therefore, should not have been included in the overhead allocated to the SAVANNAH. Eliminating the items questioned by the external auditors, we recomputed the overhead for the first 3 operating years and found that the overhead allowance paid by Maritime would have been about $13,000, $15,000, and $10,000 less in the first 3 operating years, or about $38,000 less for all 3 years.

Maritime should have required a preaudit of American Export's overhead expenses because, once the overhead allowance was agreed upon, it was not subject to adjustment. Because American Export is a subsidized operator and its accounting records are continually under review by Maritime's external auditors, a preaudit would not have required extensive additional efforts.

A Maritime official agreed that a preaudit of the administrative and general expenses allocable to American Export's freight fleet would have been helpful and that all items not permitted by the charter agreement should have been excluded when determining the overhead allowance.

The method of compensating FAST for operating the SAVANNAH has been revised for the fourth and fifth operating years. Under the revised method, FAST will receive an amount based on a negotiated percentage of SAVANNAH's gross revenues to cover an allowance for overhead and a profit. As an incentive to FAST, the amount thus computed is adjustable depending on the ratio of revenues to voyage expenses. Therefore, the amount of the overhead allowance is dependent on the amount of the gross revenues, the negotiated percentage, and FAST's success in reducing operating expenses.

AGENCY COMMENTS AND OUR EVALUATION

We proposed to the Maritime Administrator that, in negotiating the FAST profit and American Export overhead allowance for subsequent operating years, the contracting officer be required to ascertain through a preaudit of American Export overhead (1) the cost elements allocable to the SAVANNAH and (2) the reasonableness of the percentage to be applied to gross revenue in relation to the results disclosed by such preaudit.

In commenting on this matter, the Maritime Administrator stated that our comment that a preaudit would have resulted in a more realistic overhead allowance should be considered in light of the following facts:

> "(1) The government was not in a good bargaining position when the first year charter was negotiated with FAST. No other operator had indicated any substantial interest in the operation of the SAVANNAH.
>
> (2) The allowance for overhead was a factor in negotiating the operating agreement. Actually, it was considered quite reasonable in light of the unknown overhead requirements for such a ship at the time the agreement was negotiated.

(3) Basing the overhead allowance on an audit may have indicated a lower figure as being applicable, but the FAST negotiation was based on the unaudited average for all other AEIL [American Export] vessels, not on the actual overhead for SAVANNAH which was manifestly not calculable at that time.

(4) The operator has consistently claimed that the SAVANNAH required more executive and accounting time than other vessels, and we believe there is much truth in this. This would justify a higher overhead allowance for the SAVANNAH than for all its other breakbulk carriers in the European trade."

He further stated that, in light of the conditions existing at the time negotiations were in progress, the negotiating position of Maritime, and the lack of any prior factual experience upon which to base the true overhead cost requirements of commercial operation of a nuclear merchant ship, the basis used for the factor of overhead as a part of the overall charter agreement was considered by Maritime as not unreasonable.

Maritime accepted the contractor's proposal without verification, however, and did not question the overhead allowance when the nonapplicable costs were brought to its attention by the external auditors.

With regard to the additional executive and accounting time claimed by FAST, Maritime has provided for a nuclear shore staff, consisting mainly of professional personnel, to assist with the administration of the vessel's operation, which should minimize the need for additional support from the operator.

The Maritime Administrator stated that an evaluation of the equity of the fourth- and fifth-year agreements should take into consideration that maritime labor had been in an unsettled condition and that this was the principal reason why FAST had requested a change from the "estimated loss" type of incentive agreement. In the fourth year of operation, there was a 113-day longshoremen's strike and, as a result, the fourth year was quite unprofitable for FAST. He stated that FAST estimated the average profit/revenue ratio for American Export ships as 23 percent for the Mediterranean voyages while Maritime's agreement was for 19 percent of the revenue further reduced by the ratio of vessel revenue to vessel expense. He stated also that Maritime considered the current method of compensating the operator for overhead expenses to be acceptable.

We found that the operator had proposed the 23-percent profit/revenue ratio to Maritime. Maritime negotiated a 19-percent profit/revenue ratio because of the belief that the operator had assumed a lower risk in operating the SAVANNAH which it had chartered than in operating a vessel of its own because the operator does not have capital invested in the SAVANNAH.

CONCLUSION

Despite the fact that Maritime's external auditors pointed out that the American Export overhead allowance was based on data which included expense items that were either not authorized or not directly applicable to the SAVANNAH operation, the Office of Nuclear Programs did not review the expense items included in the overhead allowance. As a result, the overhead allowance was about $38,000 more for the first 3 operating years than it would have been if these expense items had been excluded.

The percentage of the gross revenue, used for the fourth and fifth operating years to determine the profit and overhead allowance, is a negotiated percentage. A Maritime official informed us that the use of the negotiated percentage of gross revenue to compensate FAST eliminates the need for a preaudit of overhead expenses. We believe, however, that, to properly evaluate the reasonableness of the ship operator's proposed percentage, an examination should be made of the available financial data affecting the negotiated percentage and that the information should be brought to the attention of responsible agency officials in a timely manner so that it can be used in negotiating the profit and overhead allowance.

RECOMMENDATION

We therefore recommend that the Maritime Administrator, in determining the FAST profit and the American Export overhead allowance for future years, require the Maritime contracting officer to ascertain through a preaudit of American Export overhead (1) the cost elements allocable to the SAVANNAH and (2) the reasonableness of the percentage to be applied to gross revenue in relation to the results disclosed by such preaudit.

CHAPTER 5

SCOPE OF REVIEW

Our review of selected aspects of the experimental commercial operation and servicing of the SAVANNAH included an examination of the contracts, and related amendments, with FAST and Todd. We reviewed contract files and related documents of Maritime in Washington, D.C., and in the district offices in New York, N.Y., and New Orleans, Louisiana, and interviewed Maritime officials at these three locations. We also reviewed pertinent Maritime external audit reports.

We reviewed selected records and files concerning the two contracts and interviewed officials of FAST and American Export at Hoboken, New Jersey, and of Todd at Galveston, Texas.

APPENDIXES

U.S. DEPARTMENT OF COMMERCE
Maritime Administration
Washington, D C 20235

OFFICE OF THE ADMINISTRATOR

950/4517

FEB 13 1970

BEST DOCUMENT AVAILABLE

Mr. Henry Eschwege
Associate Director
Civil Division
General Accounting Office
Washington, D.C. 20548

Subject GAO Proposed Report to Congress on the "Review of Contracts for the Operation and Servicing of the Nuclear Ship SAVANNAH"

Dear Mr. Eschwege

We have reviewed the draft report transmitted with your letter dated December 12, 1969, entitled "Review of Contracts for the Operation and Servicing of the Nuclear Ship SAVANNAH."

Before commenting specifically on the various conclusions and recommendations contained in the draft report, it should be noted that the contractual arrangements relating to the N.S. SAVANNAH, its operation and servicing, represent the entry by the government into a novel and theretofore unprecedented and untested area--that of the nuclear merchant ship and its experimental commercial operation. Thus, without the benefit of any prior experience or precedents to follow, it was necessary for the Maritime Administration to initiate bases upon which to develop a practical working arrangement for this first commercial operation and servicing of the N.S. SAVANNAH satisfactory to all parties. Further, it should be noted that many problems, not the least of which was labor difficulty, existed in connection with obtaining a responsible commercial operator for the SAVANNAH. With the continuing Congressional directive that the N.S. SAVANNAH remain in experimental commercial operation, it is apparent that the negotiating position of the Maritime Administration was not the most desirable. These factors, coupled with the need to solve unforeseeable problems that developed over the period of this initial nuclear merchant vessel operating program, have given the Maritime Administration valuable experience and insight upon which to draw in the future. This has been a research and development process in the true sense of initiating and developing a first phase nuclear merchant ship operation.

Our comments with respect to the specific conclusions and recommendations in the draft report are as follows.

<u>Chapter 3, "Savings Available By Discontinuing Purchase of Protection and Indemnity Insurance" - (Page 21) - Conclusion and Recommendation</u>

The draft report suggests that the Maritime Administration assume the risk for the P&I insurance on the SAVANNAH. The draft report states:

> "In our opinion, by requiring FAST to carry P&I insurance for cargo and illness or injury claims, Maritime has incurred substantial premium costs in relation to the claims which have been paid or payable by the underwriter. We believe that, to avoid incurring such costs, Maritime should assume the risk for the P&I insurance on the SAVANNAH."

When the period of experimental commercial operation was being planned, it was our desire to duplicate insofar as possible the commercial shipping environment. A feature of this environment is commercial P&I insurance. Such insurance was found to be commercially available without penalty because of the nuclear plant. Our operation has proven that the nuclear merchant ship may very well be a better risk than other merchant ships, perhaps because the crew is more safety conscious. In any event, the operation has demonstrated the ready availability of commercial P&I insurance for nuclear merchant vessels. We do agree that the point has now been made and, if past safety experience should continue, a saving may be realized as a result of self-insurance by the government. It is our intention to follow your suggestion for FY 1971 and later.

Chapter 4, "Need for Determination of Allowable Overhead Expenses" - (Page 25) - Conclusion and Recommendation

The comment that a preaudit would have resulted in a more realistic "overhead" allowance as it relates to determination of payments to First Atomic Ship Transport (FAST), a subsidiary of American Export Isbrandtsen Lines, Inc. (AEIL), under the Bareboat Charter should be considered in light of the following facts.

(1) The government was not in a good bargaining position when the first year charter was negotiated with FAST. No other operator had indicated any substantial interest in the operation of the SAVANNAH.

(2) The allowance for overhead was a factor in negotiating the operating agreement. Actually, it was considered quite reasonable in light of the unknown overhead requirements for such a ship at the time the agreement was negotiated.

(3) Basing the overhead allowance on an audit may have indicated a lower figure as being applicable, but the FAST negotiation was based on

BEST DOCUMENT AVAILABLE

the unaudited average for all other AEIL vessels, not on the actual overhead for SAVANNAH which was manifestly not calculable at that time.

(4) The operator has consistently claimed that the SAVANNAH required more executive and accounting time than other vessels, and we believe there is much truth in this. This would justify a higher overhead allowance for the SAVANNAH than for all its other breakbulk carriers in the European trade.

In evaluating the equity of the fourth and fifth year agreements, it is well to remember that maritime labor has been in an unsettled condition, and this was the chief reason that FAST requested a change from the "estimated loss" type incentive agreement. These fears were realized in the fourth year when there was a 113-day longshoremen strike. As a result, the fourth year was quite unprofitable for FAST. As a matter of fact, FAST estimated the average profit/revenue ratio (for AEIL) as .23 for the Mediterranean, while our agreement was for .19 further reduced by the ratio of vessel revenue to vessel expense. In the fifth year revenues have been low, and FAST is not likely to earn much "profit."

Therefore, in light of the conditions existent at the time negotiations were in progress, the negotiating position of the Maritime Administration, and the lack of any prior factual experience upon which to base the true overhead cost requirements of commercial operation of a nuclear merchant ship, the basis used for the factor of overhead as a part of the overall charter agreement was considered by the Maritime Administration as not being unreasonable. It should also be noted that the charter was originally for a 3 year period with only certain figures in the compensation formula to be subject to change each year during that period and such changes were to reflect the general principles of the original agreement. This was the original negotiated transaction which, upon completion of its original 3 year term, has been revised as to the method of computing compensation to FAST. Again, however, overhead as a factor in the compensation calculation was only a part of the overall negotiated result, which is considered acceptable.

[GAO note: Deleted material relates to comments no longer relevant to the matters discussed in this report.]

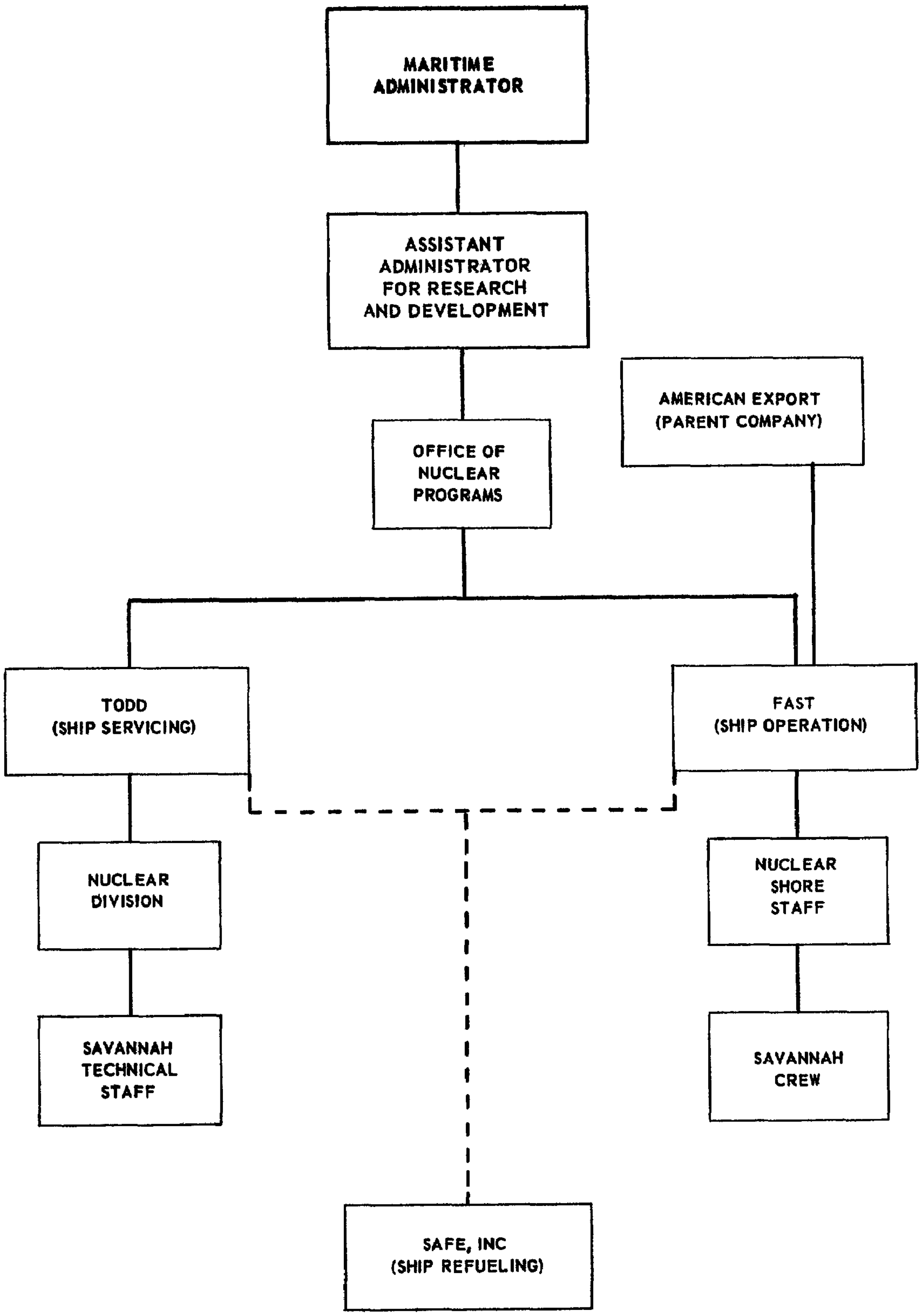
Please contact us if we can be of further assistance.

Sincerely,

A. E. Gibson

A. E. GIBSON
Maritime Administrator

ORGANIZATIONAL ARRANGEMENTS AND RESPONSIBILITIES FOR THE OPERATION AND SERVICING OF THE SAVANNAH AS OF AUGUST 8, 1969



PRINCIPAL OFFICIALS OF THE DEPARTMENT OF COMMERCE RESPONSIBLE FOR THE ADMINISTRATION OF THE ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
SECRETARY OF COMMERCE:		
Maurice H. Stans	Jan. 1969	Present
C. R. Smith	Mar. 1968	Jan. 1969
Alexander B. Trowbridge	June 1967	Mar. 1968
Alexander B. Trowbridge (acting)	Jan. 1967	June 1967
John T. Connor	Jan. 1965	Jan. 1967
MARITIME ADMINISTRATOR:		
Andrew E. Gibson	Mar. 1969	Present
James W. Gulick (acting)	June 1966	Mar. 1969
Nicholas Johnson	Mar. 1964	June 1966
ASSISTANT ADMINISTRATOR FOR RESEARCH AND DEVELOPMENT:		
Marvin Pitkin	May 1969	Present
CHIEF, OFFICE OF RESEARCH AND DEVELOPMENT (note a):		
E. Kemper Sullivan (acting)	May 1966	Aug. 1969
Edward M. MacCutcheon	July 1962	May 1966
CHIEF, OFFICE OF NUCLEAR PROGRAMS:		
Delma L. Crook (acting)	Aug. 1969	Present

[a] On August 8, 1969, the nuclear program activities were transferred to the Office of Nuclear Programs.

U S. GAO, Wash., D.C