MAY 31 1994

License Nos. 37-02006-05
SUB-831
Docket No: 030-06046
040-07344
Control No: 113059
113058

Martin Marietta Corporation
ATTN: Marcus C. Bennett,
Vice President & Chief Financial Officer
P.O. Box 8555
Philadelphia, Pennsylvania 19101

Subject: Financial Assurance for Decommissioning

This is in reference to your submittals dated July 27, 1990, April 4, 1991, and April 26, 1994 to provide financial assurance for License Nos. 37-02006-05 and SUB-831. We have reviewed these documents and have no further questions at this time.

Based on the information provided in the above referenced documents, you are presently in compliance with the financial assurance requirements outlined in the decommissioning rule in 10 CFR 30.35, and 40.36.

Please note that a decommissioning funding plan, including an actual cost estimate must be submitted along with any application for license renewal.

If you have any questions, please contact Anthony Dimitriadis, of my staff, at (610) 337-6953.

Your cooperation with us is appreciated.

Sincerely,

Original Signed By:
Mohamed M. Shanbaky

Mohamed M. Shanbaky, Chief
Research and Development Section
Division of Radiation Safety
and Safeguards

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F-42

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions 4/4
FOIA- 2007-304

ML 10
111

cc:
Martin Marietta Corporation
ATTN: S.J. Mucha, M.D., Chairman
Ionizing Radiation Advisory Group
P.O. Box 8555
Philadelphia, Pennsylvania 19101

Martin Marietta Corporation
ATTN: John L. Andrews
Radiation Safety Officer
Astro Space
P.O. Box 8555
Philadelphia, Pennsylvania 19101

bcc:
M. Shanbaky, RI
A. Dimitriadis, RI

DRSS:RI	DRSS:RI
Dimitriadis	Shanbaky
05/27/94	05/27/94

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MARTIN MARIETTA

MARTIN MARIETTA CORPORATION

ASTRO SPACE
P.O. BOX 8555, PHILADELPHIA, PA 19101
PHONE: (215) 354-3840
FAX: (215) 354--3974

April 26, 1994

Mr. Mohamed M. Shanbaky, Chief
Division of Radiation Safety and Safeguards
US Nuclear Regulatory Commission, Region 1
475 Allendale Road
King of Prussia , PA 19406-1415

Dear Mr. Shanbaky:

Subject: **Financial Assurance for Decommissioning**

re License Nos.	SUB-831	37-02006-05	37-02006-09
Control Nos.	113058	113059	unassigned
Docket Nos.	040-07344	030-06046	030-12894

In response to your letter of March 1 to Dr. Mucha at this location, by this letter and enclosures, Martin Marietta Astro Space hereby submits necessary documentation to comply with 10CFR 30.35 and 40.42 for the three radioactive materials licenses held at this 'Valley Forge' facility. We appreciate the several week extension provided to complete the activity a first time.

Attachment No. 1 is a Decommissioning Funding Plan which is an update of the one submitted to Mr. R. Bernero (NRC Hdqrs) by John F. McLaverty of the then GE Astro Space in January 1992.

Attachment No. 2 is a Self Guarantee that funds will be available if and when a DFP is implemented, per the method of 10CFR30, App. C.

If you have any questions regarding this, feel free to call me.

Sincerely,

John L. Andrews,
Radiation Safety Officer

cc: S.J. M

Original
Annual Report
Appended

OFFICIAL RECORD COPY

ATTACHMENT NO. 1

Decommissioning Funding Plan

for

NRC Materials Licenses
SUB-831
37-02006-05
37-02006-09

April 22, 1994

Martin Marietta Corporation
Astro Space
(Valley Forge Facility)
P.O. Box 8555
Philadelphia, PA 19101

Decommissioning Funding Plan (DFP)

1.0 Scope

Martin Marietta Corporation, Astro Space (Valley Forge Facility) herein presents its updated DFP for NRC Materials License Nos. SUB-831, 37-02006-05 and 37-02006-09. This plan describes the radioactive byproduct and source material in inventory, their ownership and the current estimated costs for their proper removal.

2.0 Radioactive Material Inventory

Radioactive material inventory on these licenses generally consists of sealed sources. At the present time there is no identifiable radioactive contamination, fixed equipment or structure at sites identified on these licenses; any such item has been decontaminated.

Table 1 tabulates the activity and status of the complete current inventory. The items "A-N" are those identified in the original DFP; a copy of same is appended. Additions to the inventory since October 1991are shown as items "O-S". For this status, reductions occured because of transfer, decay in storage, inventory correction and decontamination activity. For item 'J', two Gammacells, the activity is nominal since 'reloads' occur from time to time and these do not affect DFP costs.

3.0 DFP Cost Estimate

Table 1 also presents estimated costs, by item, for decommissioning of inventory which is Martin Marietta property. These costs come directly from the appended original DFP or are reasonable estimates for the newly added items, if they are Martin Marietta property. Of the new items, we expect only 'R' to be here after 1994.

It is presumed that, with respect to radioactive materials owned by agencies of the U.S. government and held here for use, the U.S. government will assume any and all costs of physical transfer.

The decommissionimg costs shown in Table 1 total to the amount of $ 230,000; inventory items add to the subtotal of $ 218,700 and the remainder covers estimated supervisory and other 'office-type support' charges of an administrative nature. The item-specific costs are a reduction from the total of $ 370,000 in the original DFP because of the exclusion of government property ($ 145,000) and elimination of items removed from inventory ($ 8500). Additions for new items total $4,000 and a separate cost of $ 1,000 has been given for item 'G'.

4.0 Financial Assurance

Martin Marietta by separate Attachment (No. 2) provides Self Guarantee per the method of App. C of 10CFR30. A biannual review and update of the required amount of Self Guarantee will be performed to provide full and current coverage.

Table 1 Radioactive Materials and Estimated Decommissioning Costs ($)

Rad. Mat'l Item	Isotope / Activity (Curies)	NRC License # SUB 831	37-02006-05	37-02006-09	*: Notes
		Decommissioning Costs			
A	Am241 / 1.0		160,000		
B	Sr90 / 10.0		3,700		
C	Sr90 / 0.1		1,500		
D	Pu239 / 5 micro		5,000		
E	Pu238 / 0.09		15,000		
F	Co60 / 0.016		1,500		
G	Various / < 0.001		1,000		Density gauge and instrument calibration sources.
H	Kr85 / 0				Transferred in 1992.
I	Cs137 / 0.1 nano		*see note.		DOD/DNA property; transfer in process.
J	Co60 (b)(4)			25,000	Two Gammacells
K	Depleted U (DU) / < 10 micro	2,000			Urethane resin with DU as a filler (250 cc).
L	U235 / 0				Container tag marking was in error; see item 'O' for contents.
M	Th232 / 0.0063	*see note.			USAF property (form is MgTh plates); transfer in process.
N	Various / 0				Decontamination of Room U8604 completed (1/94).
O (new)	U / approx. 45 lbs	2,000			Covered metal pail marked as item 'L' has 2 bags of low enrichment U dioxide.
P (new)	Kr85 / 0.66		1,500		Activity as of 1/94.
Q (new)	Depleted U / < 0.1	*see note.			Two items of DOE property on short term loan from Sandia and Los Alamos.
R (new)	Th232 / approx. 0.003	*see note.			USAF property (MgTh) in multiple spacecraft ready for shipment.
S (new)	Various / < 1 milli		500		Waste, to be removed in 1994.
SUBTOTALS		4,000	189,700	25,000	218,700
Administration (See text).					11,300
TOTAL					230,000

The following information provides a itemized breakdown of the cost esimate.

	License	ISOTOPE	ACTIVITY	COST
A	37-02006-05	Am-241	1.0 Ci	$ 160,000

This source will have to be disposed of as Class C radioactive material (long half life). The source will need to be placed in a mass weighing at least 22,000 pounds to be below the 100nCi/g limit. The final volume is estimated to be 216 cubic feet. US Ecology in Richland WA was contacted in July 1990 and quoted a disposal price of $80,000.00. Considering the anticipated increases in disposal costs over the next 5 years, this price is doubled for this cost estimate.

B	37-02006-05	Sr-90	10.0 Ci	$ 3,700

This source will have to be disposed of as Class B radioactive material in a 55 gallon drum (7.4 cft). For this estimate the basic burial cost for Class B material is $500/cft.

C	37-02006-05	Sr-90	0.1 Ci	$ 1,500

This source will have to be disposed of as Class A radioactive material in one 55 gallon drum. For this estimate the basic burial cost for Class A material is $200/cft.

D	37-02006-05	Pu-239	0.000005 Ci	$ 5,000
E	37-02006-05	Pu-238	0.09 Ci	$ 15,000

These sources are special nuclear material and therefore a limit of 100nCi/g applies. These sources can be placed in individual 55 gallon drums filled with concrete (approx. 1000 lbs). Pu-239 - Class A. Pu-238 - Class C. The basic burial cost for Class C material is $1000.00/cft.

F	37-02006-05	Co-60	0.081 Ci	$ 1,500
G	37-02006-05	Density gauge & assorted check sources	<0.001Ci	

Class A radioactive material in one 55 gallon drum.

K | SUB-831 | Contaminated oil (250 cc) | ? | $ 2000

This material was surveyed in October 1991 and showed gamma radiation levels just above background levels. Aliquots of the oil are being collected for further analysis. For this estimate it is assumed that the oil can be solidified and disposed of as a Class A waste. The estimate also includes the cost of analysis.

L | SUB-831 | U-235 | 0.01 Ci | $ 2000

U-235 is fissionable material which will be returned to the DOE. The cost of disposal will be incurred in packaging and shipping.

M | SUB-831 | MgTh | 4500 lbs | $ 45,000

A 1991 disposal price quote of $5/lb. was obtained from Spectralite Consortium Inc. This price is doubled for this cost estimate.

Costs for preparing sources for shipment, shipping expenses etc. have been factored into the cost estimates by doubling the burial costs. The burial costs were provided by Mr. William Dornsife, who is chief technical expert for the Appalachian Compact at PA Department of Environmental Resources. The basic burial cost of $100/cft. for Class A waste, $250/cft. for Class B waste and $500/cft. for Class C waste was doubled for the current estimate.

U8609

One room remains within the facility where there may be a possibility of decontamination activity. This is a lab which was designed to control airborne radioactivity (low specific activity materials). The lab contains two HEPA filtered hoods and a glove box. Radioactive material use has been terminated in this area. The decontamination work and final clearance radiation survey will be conducted by GE personnel. **Assume one drum of Class A waste (HEPA filters, rags etc.) at a cost of $1,500.**

N

ATTACHMENT NO. 2

Decommissioning Funding Self Guarantee Documents

for

NRC Materials Licenses
SUB-831
37-02006-05
37-02006-09

April 27, 1994

Martin Marietta Corporation
Astro Space
(Valley Forge Facility)
P.O. Box 8555
Philadelphia, PA 19101

Self-Guarantee of Martin Marietta Corporation

License Nos.	37-02006-05
	SUB-831
	37-02006-09
Docket Nos.	030-06046
	040-07344
	030-12894
Control Nos.	113059
	113058
	Not available

Martin Marietta Corporation (hereinafter, "Licensee"), licensee of the above referenced Licenses issued by the U. S. Nuclear Regulatory Commission (hereinafter, "Commission"), in order to provide reasonable assurance of the availability of funds for decommissioning of facilities utilized pursuant to the referenced licenses, hereby guarantees to the Commission that funds will be available for decommissioning costs in the amount of $230,000, as detailed in the Decommissioning Funding plan for the facilities, (Attachment 1 hereto) and as evidenced by the demonstration (Attachment 2 hereto) that the Licensee satisfies the financial test of Section II, Appendix C to 40 C. F. R. Part 30.

As further required by 10 C. F. R. Part 30, Appendix C, Licensee agrees:

A. This guarantee will remain in force unless Licensee sends notice of cancellation by certified mail to the Commission. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by the Commission, as evidenced by the return receipt.

B. Licensee shall provide alternative financial assurance as specified in the Commission's regulations within 90 days following receipt by the Commission of a notice of cancellation of the guarantee.

C. The guarantee and financial test provisions must remain in effect until the Commission has terminated the license or until another financial assurance method acceptable to the commission has been put in effect by Licensee.

D. Licensee will promptly forward to the Commission and Licensee's independent auditor all reports covering the latest financial year filed by the licensee* with the Securities and Exchange Commission pursuant to the requirements of Section 13 of the Securities and Exchange Act of 1934.

E. If, at any time, Licensee's most recent bond issuance ceases to the rated in any category of "A" or above by either Standard and Poor's or Moody's, Licensee will provide notice in writing of such fact to the Commission within 20 days after publication of the change by the rating service. If Licensee's most recent bond issuance ceases to be rated in any category of A or above by both Standard and Poor's and Moody's, Licensee no longer meets the requirements of Section II.A of this appendix.

* 1993 Annual Report appended.

F. When required by regulation or order of the Commission, Licensee will fund and carry out required decommissioning activities, or Licensee will set up and fund a trust in the amount of the current cost estimates for decommissioning, upon issuance of an order by the Commission to do so.

Agreed to this 26th day of April, 1994

Marcus C. Bennett
Vice President and
Chief Financial Officer

Table 1 Radioactive Materials and Estimated Decommissioning Costs ($)

Rad. Mat'l Item	Isotope / Activity (Curies)	NRC License # SUB 831	37-02006-05	37-02006-09	*: Notes
		Decommissioning Costs			
A	Am241 / 1.0		160,000		
B	Sr90 / 10.0		3,700		
C	Sr90 / 0.1		1,500		
D	Pu239 / 5 micro		5,000		
E	Pu238 / 0.09		15,000		
F	Co60 / 0.016		1,500		
G	Various / < 0.001		1,000		Density gauge and instrument calibration sources.
H	Kr85 / 0				Transferred in 1992.
I	Cs137 / 0.1 nano		*see note.		DOD/DNA property; transfer in process.
J	Co60 / (b)(4)			25,000	Two Gammacells
K	Depleted U (DU) / < 10 micro	2,000			Urethane resin with DU as a filler (250 cc).
L	U235 / 0				Container tag marking was in error; see item 'O' for contents.
M	Th232 / 0.0063	*see note.			USAF property (form is MgTh plates); transfer in process.
N	Various / 0				Decontamination of Room U8604 completed (1/94).
O (new)	U / approx. 45 lbs	2,000			Covered metal pail marked as item 'L' has 2 bags of low enrichment U dioxide.
P (new)	Kr85 / 0.66		1,500		Activity as of 1/94.
Q (new)	Depleted U / < 0.1	*see note.			Two items of DOE property on short term loan from Sandia and Los Alamos.
R (new)	Th232 / approx. 0.003	*see note.			USAF property (MgTh) in multiple spacecraft ready for shipment.
S (new)	Various / < 1 milli		500		Waste, to be removed in 1994.
SUBTOTALS		4,000	189,700	25,000	218,700
Administration (See text).					11,300
TOTAL					230,000

License Nos.	37-02006-05
	SUB-831
	37-02006-09
Docket Nos.	030-06046
	040-07344
	030-12894
Control Nos.	113059
	113058
	Not available

Attachment 2 to Self-Guarantee of Martin Marietta Corporation

Demonstration that Company Passes Financial Test of Part 30, Appendix C

A. To pass the financial test, a company must meet all of the following criteria:

(1) Tangible net worth at least 10 times the total current decommissioning cost estimate (or the current amount required if certification is used) for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor.

Tangible net worth of Martin Marietta Corporation	$186,345,000
Total current decommissioning estimate per Attachment 1	$ 230,000

Tangible net worth exceeds 10 Times the total current decommissioning estimate.

(2) Assets located in the United States amounting to at least 90 percent of total assets or at least 10 times the total current decommissioning cost estimate (or the current amount required if certification is used) for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor.

The Corporation certifies that over 90% of its total assets ($7.7 Billion at December 31, 1993) are located in the United States and that these assets exceed the total current decommissioning cost estimate as disclosed in Attachment 1.

(3) A current rating for its most recent bond issuance of AAA, AA or A as issued by Standard and Poor's (S&P), or Aaa, Aa, or A as issued by Moody's.

The Corporation's most recent bond issue, dated April 25, 1993 was rated "A" by Standard and Poor's.

B. To pass the financial test, a company must meet all of the following additional requirements.

(1) The company must have at least one class of equity securities registered under the Securities Exchange Act of 1934.

The Corporation's equity securities are registered under the Securities Exchange Act of 1934.

ERNST & YOUNG

1225 Connecticut Avenue, N.W.
Washington, D.C. 20036

Phone: 202 327 6000

Report Of Independent Auditors

Martin Marietta Corporation

We have audited the balance sheet of Martin Marietta Corporation and consolidated subsidiaries as of December 31, 1993, and the related statements of earnings, shareowners' equity, and cash flows for the year then ended, and have issued our report thereon dated January 21, 1994. These financial statements are the responsibility of the Corporation's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

We have read "Attachment 2 to Self-Guarantee of Martin Marietta Corporation" prepared by the Corporation in connection with its Financial Assurance Submission. We have compared the amount for Item A1 appearing therein with the amount derived from the Corporation's consolidated financial statements for the year ended December 31, 1993. We have reviewed the Corporation's balance sheet to determine whether 90% or more of the consolidated assets are located in the United States and, therefore, the response to Item A2 is appropriate.

Because the above procedures do not constitute an audit made in accordance with generally accepted auditing standards, we do not express an opinion on the specified information referred to above. In connection with the procedures referred to above, no matters came to our attention that caused us to believe the specified information should be adjusted.

This letter is furnished solely to assist the Corporation in fulfilling its 1994 Financial Assurance Submission and is not to be used for any other purpose.

Ernst + Young

March 24, 1994

MAR · 1 1994

License Nos. 37-02006-05
SUB-831
Docket Nos. 030-06046
040-07344
Control No. 113059
113058

Martin Marietta Corporation
ATTN: S. J. Mucha, M.D., Chairman
Ionizing Radiation Advisory Group
P. O. Box 8555
Philadelphia, Pennsylvania 19101

Dear Dr. Mucha:

SUBJECT: FINANCIAL ASSURANCE FOR DECOMMISSIONING

Our records show that as of April 29, 1993, a change of ownership from General Electric Company to Martin Marietta Corporation was finalized. This change of ownership resulted in Martin Marietta acquiring operations, facilities and radioactive materials authorized by the above listed licenses. At this time, you are required to comply with 10 CFR 30.35. This regulation requires licensees who are authorized to possess amounts of licensed material listed in the above referenced licenses to submit a decommissioning funding plan or a certification of financial assurance for decommissioning. Upon review of the above referenced licenses, we request the following information:

1. **Submit a Decommissioning Funding Plan (DFP) or a Certification of Financial Assurance.**

   10 CFR 30.35(c)(2) requires licensees to submit either a certification statement or a decommissioning funding plan including an actual cost estimate.

   Based upon the possession limits authorized on License Nos. 37-02006-05 and SUB-831, a certification of financial assurance for $750,000 is required at this time. The statement of certification, in addition to providing information that would allow the NRC to verify the certification amount (e.g., the names and locations of the facilities for which financial assurance is provided, and the amount and types of material handled), officially certifies that the licensee is in compliance with the decommissioning rules.

Please submit certification of financial assurance or a decommissioning funding plan including an actual cost estimate along with financial assurance for the specified amount. You may refer to Regulatory Guide 3.66 "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70 and 72" (June 1990), (copy enclosed).

Please note that if you decide to submit certification for $750,000 rather than a Decommissioning Funding Plan at this time, you must include a DFP and actual cost estimate with your application for license renewal due on or before the expiration date listed in Item 4 of each respective license. The enclosed NUREG/CR-1754, Addendum 1, may be helpful in preparing your cost estimate.

2. **Use of Standby Trust Funds**

Under the decommissioning regulations, 10 CFR 30.35(f)(ii), certain financial instruments must be payable to a "trust established for decommissioning costs." This is because funds paid directly to the NRC must be deposited in the U.S. Treasury and are not available for decommissioning costs. To avoid this possibility, standby trust funds must be established if the following instruments are used: Letter of Credit, Line of Credit, Surety Bond. Please refer to Regulatory Guide 3.66 and adhere as close as possible to the recommended wording.

Satisfactory financial assurance is required for your licenses. Therefore, we request that you respond within 30 calendar days of the date of this letter. Please reply in duplicate to my attention at the Region I office and when submitting financial documents, be sure they are completely executed, and originally signed with all appropriate seals. You may refer to Mail Control Nos. 113059/113058.

If you have any questions regarding this letter, please contact Anthony Dimitriadis of my staff at (215) 337-6953.

Sincerely,
Original Signed By:
Mohamed M. Shanbaky

Mohamed M. Shanbaky, Chief
Research and Development Section
Division of Radiation Safety
and Safeguards

L 10

Enclosures:
1. Regulatory Guide 3.66
2. NUREG/CR-1754/Addendum 1

bcc:
M. Shanbaky, RI
A. Dimitriadis, RI

DRSS:RI
Dimitriadis/GMP
01/11/94

DRSS:RI
Shanbaky
02/25/94

IL 10

GE Astro Space

Astro-Space Division
General Electric Company
P.O. Box 8555, Philadelphia, PA 19101
215 354-1000

Mr. Robert Bernero, Director
Office of Regulatory Materials Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington DC 20555

January 10, 1992

Subject: **Financial Assurance: General Electric Company Submittal of March 22, 1991**

RE: **Decommissioning Funding Plan Cost Estimate Substantiation GE Aerospace - King of Prussia, PA**

Licenses: 37-02006-05
37-02006-09
SUB-831

A decommissioning funding plan cost estimate for GE Aerospace operations was prepared in July 1990. The cost estimate at that time considered the above three licenses which covered two facilities (Philadelphia, PA and King of Prussia, PA) where radioactive materials were being actively utilized or stored in radioactive material vaults. The plan was based upon the premise that the major problem for Aerospace operations is not the decontamination of facilities but rather the disposal of (primarily) sealed sources of radioactive materials. The cost estimate for decomissioning the licensed Aerospace facilities in July of 1990 was $476,000.00. A surety bond for $500,000.00 was subsequently provided through Chubb Group of Insurance Companies on August 6, 1990.

Since the initial cost estimate was developed, GE Aerospace has accomplished the disposition of all sources at our Philadelphia facility and has submitted the final radiation survey of the vault to the NRC for review. At King of Prussia over 90% of the radioactive material inventory has been disposed to land burial at the Hanford site in Washington state. Our inventory of approximately 200 radioactive sources has been reduced to 13 items.

Of the two radioactive material use areas which in the original estimate were referenced as possibly requiring decontamination activity, one area has been cleared for unrestricted use.

The current cost estimate for GE Aerospace under NRC licenses 37-02006-05, 37-02006-09 and SUB-831 is $370,000.00.

The following information provides a itemized breakdown of the cost esimate.

License	ISOTOPE	ACTIVITY	COST
37-02006-05	Am-241	1.0 Ci	$ 160,000

This source will have to be disposed of as Class C radioactive material (long half life). The source will need to be placed in a mass weighing at least 22,000 pounds to be below the 100nCi/g limit. The final volume is estimated to be 216 cubic feet. US Ecology in Richland WA was contacted in July 1990 and quoted a disposal price of $80,000.00. Considering the anticipated increases in disposal costs over the next 5 years, this price is doubled for this cost estimate.

37-02006-05	Sr-90	10.0 Ci	$ 3,700

This source will have to be disposed of as Class B radioactive material in a 55 gallon drum (7.4 cft). For this estimate the basic burial cost for Class B material is $500/cft.

37-02006-05	Sr-90	0.1 Ci	$ 1,500

This source will have to be disposed of as Class A radioactive material in one 55 gallon drum. For this estimate the basic burial cost for Class A material is $200/cft.

37-02006-05	Pu-239	0.000005 Ci	$ 5,000
37-02006-05	Pu-238	0.09 Ci	$ 15,000

These sources are special nuclear material and therefore a limit of 100nCi/g applies. These sources can be placed in individual 55 gallon drums filled with concrete (approx. 1000 lbs). Pu-239 - Class A. Pu-238 - Class C. The basic burial cost for Class C material is $1000.00/cft.

37-02006-05	Co-60	0.081 Ci	$ 1,500
37-02006-05	Density gauge & assorted check sources	<0.001Ci	

Class A radioactive material in one 55 gallon drum.

37-02006-05 Kr-85 21.0 Ci $ 5,000

The Kr-85 gas is contained in eleven Type K compressed gas cylinders totaling 15,800 psi. Our options for disposition at this point include land burial, venting or recycling.

1. Land burial restrictions would require that the gas be dispensed into 720 type A bottles at 1.5 atmospheres.The total volume would approach 3800 cft. at a disposal cost (Class A) of $775,000.00.

2. GE has conducted an Environmental Impact Assessment addressing the release of Kr-85 gas from the King of Prussia facility. As a result of this study, a request for an amendment to license 37-02006-05 was submitted to the Region I NRC offices on May 31, 1991. The amendment incorporates release limits of:

0.5 Ci/week
2.0 Ci/quarter
7.5 Ci/year
1.2 x10 uCi/ml point of discharge limit

With these limits in place, venting the Kr-85 gas could be accomplished over a four year period at minimal cost (<$1000).

3. Due to the national shortage in supplies of Kr-85 gas, Amersham Corporation has expressed interest in acquiring the Kr-85 gas for recycling. GE is currently pursuing this preferred course of action. Costs may include packaging and transportation at a cost of $5000.00.

37-02006-05 contaminated satellite (Cs-137) 0.001uCi $100,000

This item is a satellite midbody assembly which was contaminated during underground nuclear testing. The structure was decontaminated at the test site in 1985. A survey conducted in April 1991 indicated external radiation levels of about 1.5 to 3.0 microR/hr above background. Removable radiation levels (beta) did exceed 1000 dpm for one location on the structure. Volume reduction would definitely be appropriate for this item which is now housed in 512 cft box. This estimate, however, covers the cost of disposal as a Class A waste without volume reduction.

37-02006-09 Co-60 (b)(4) $ 25,000

This item consists of two irradiators containing (b)(4) and (b)(4) (nominal) of Co-60 in Certified Special Form. Nordion (formerly AECL) has agreed to remove the sources from the GE facility for $18,600.00. The current cost estimate has been adjusted for an inflation rate of 10%/year over 5 years.

SUB-831	**Contaminated oil (250 cc)**	**?**	**$ 2000**

This material was surveyed in October 1991 and showed gamma radiation levels just above background levels. Aliquots of the oil are being collected for further analysis. For this estimate it is assumed that the oil can be solidified and disposed of as a Class A waste. The estimate also includes the cost of analysis.

SUB-831	**U-235**	**0.01 Ci**	**$ 2000**

U-235 is fissionable material which will be returned to the DOE. The cost of disposal will be incurred in packaging and shipping.

SUB-831	**MgTh**	**4500 lbs**	**$ 45,000**

A 1991 disposal price quote of $5/lb. was obtained from Spectralite Consortium Inc. This price is doubled for this cost estimate.

Costs for preparing sources for shipment, shipping expenses etc. have been factored into the cost estimates by doubling the burial costs. The burial costs were provided by Mr. William Dornsife, who is chief technical expert for the Appalachian Compact at PA Department of Environmental Resources. The basic burial cost of $100/cft. for Class A waste, $250/cft. for Class B waste and $500/cft. for Class C waste was doubled for the current estimate.

One room remains within the facility where there may be a possibility of decontamination activity. This is a lab which was designed to control airborne radioactivity (low specific activity materials). The lab contains two HEPA filtered hoods and a glove box. Radioactive material use has been terminated in this area. The decontamination work and final clearance radiation survey will be conducted by GE personnel. **Assume one drum of Class A waste (HEPA filters, rags etc.) at a cost of $1,500.**

Based on the available information, the comprehensive cost estimate for decommissioning facilities under the cited NRC licenses is $370,000.00. This estimate has been corrected for inflation in that the disposal costs are based on the 1996 anticipated cost for the Pennsylvania Low Level Radioactive Waste Repository. However, it should be noted that since the costs for radioactive waste contractors and disposal costs have significantly exceeded the national inflation rate, projections of this nature are difficult at best. It is the intention of GE Aerospace to revise these estimates as necessary to ensure that sufficient financial assurance is maintained in compliance with NRC regulations.

If there are any questions concerning this report, feel free to contact the undersigned at phone (215) 354-1085.

John F. McLaverty
Senior Industrial Hygienist
Environmental, Health &
Safety Department

cc: Mr Bertram Wolfe
Vice President & General Manager
GE Company, San Jose, CA

Mr. Melvin B. Schweiger
Manager, Environmental Programs
GE Aerospace, King of Prussia, PA

Mr. Paul Vincent
Manager, EHS Department
GE Astro Space Division, King of Prussia, PA

GE Nuclear Energy

Bertram Wolfe
Vice President and General Manager

General Electric Company
175 Curtner Avenue, San Jose, CA 95125
408 925-5300

October 31, 1991

Mr. Robert M. Bernero, Director
Office of Nuclear Materials Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: **FINANCIAL ASSURANCE; GENERAL ELECTRIC SUBMITTAL OF MARCH 22, 1991**

Reference: Letter dated August 1991, R. Bernero, NRC Addressed to Dr. Wolfe, GE; Subject - Response to Financial Assurance Submittal of March 22, 1991

Dear Mr. Bernero:

General Electric has reviewed the NRC's request to modify the March 22, 1991 submission and offers the following:

NRC's Item Number 1

"The three cost estimates (Sub-831, 37-020006-09, and 37-020006-05) totaling $800K are unsubstantiated. General Electric Company (GE) should document the cost estimates using the cost estimate tables in Appendix F, Regulatory Guide 3.66."

GE Aerospace will provide the support to their cost estimate for Decommissioning in the near future.

NRC's Item Number 2

"Decommissioning cost estimates for R-33 (NTR), TR-1 (GETR), DR-10 (EVESR), DPR-1 (VBWR):"

> "GE maintains that adjustments for inflation will be made every 5 years or when significant changes such as burial costs or changes in facility conditions occur. Regulatory Guide 1.159, page 7, states that for non-electrical utility licensees who prepare a decommissioning cost estimate, adjustments to the cost estimate should be prepared annually, but need not be submitted to the Nuclear Regulatory Commission (NRC) Staff. GE should state that they will prepare an annual adjustment to the decommissioning cost estimate for inspection by NRC Staff."

GE will comply with NRC's request and update the cost estimate annually.

NRC's Item Number 3

"Irrevocable Standby Letter of Credit:"

The blank space in subparagraph 2 should state ". . . . under authority of the U.S. Nuclear Regulatory Commission."

Enclosed is the revision to the Standby Letter of Credit as requested.

NRC's Item Number 4

"Standby Trust Agreement:

(Section 5) - The statement that 'no withdrawal can exceed 100 percent of the outstanding balance' must be amended to '10 percent of the outstanding balance'."

Enclosed is the revision to the Standby Trust Agreement that you requested. The modification has been approved by GE. Manufacturers Hanover Trust Company requires that the NRC approve the change and forward the document to the bank. Upon receipt of the requested modification Manufacturers Hanover Trust Company will approve the document and return such to GE and the NRC. Please approve the enclosed modification request and return it to GE for transmittal to the bank.

B. Wolfe

Dr. B. Wolfe,
Vice President and General Manager

Enclosures

AMENDMENT NUMBER ONE TO

TRUST AGREEMENT, ENTERED INTO AS OF MARCH 22, 1991

BY AND BETWEEN GENERAL ELECTRIC COMPANY,

A NEW YORK CORPORATION AND MANUFACTURERS HANOVER

TRUST COMPANY, THE TRUSTEE

THE NUCLEAR REGULATORY COMMISSION (NRC) AND GE NUCLEAR ENERGY DESIRE TO MODIFY THE DOCUMENT AS FOLLOWS:

(SECTION 5) - THE STATEMENT THAT "NO WITHDRAWAL CAN EXCEED 100 PERCENT OF THE OUTSTANDING BALANCE" IS AMENDED TO "10 PERCENT OF THE OUTSTANDING BALANCE".

APPROVED: B Wolfe

DR. B. WOLFE
VICE PRESIDENT AND GENERAL MANAGER
GE NUCLEAR ENERGY

ROBERT M. BERNERO, DIRECTOR
OFFICE OF NUCLEAR MATERIAL SAFETY
AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION

MANUFACTURERS HANOVER TRUST COMPANY
(SIGNATURE OF REPRESENTATIVE OF TRUSTEE)

MANUFACTURER HANOVER

Manufacturers Hanover Trust Company
Geoserve Trade Services
4 New York Plaza
New York, NY 10004

	AMENDMENT TO DOCUMENTARY CREDIT — NUMBER (b)(4)
DATE OF AMENDMENT SEPTEMBER 19,1991	
APPLICANT: GENERAL ELECTRIC CO. 570 LEXINGTON AVE. NEW YORK, N.Y. 10022 ATTN: R.A. LATTERNER	BENEFICIARY: U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, D.C. 20555
ADVISING BANK:	AMENDMENT SEQUENCE NUMBER 502 THIS AMENDMENT IS TO BE CONSIDERED AS PART OF THE ABOVE MENTIONED CREDIT AND MUST BE ATTACHED THERE TO:

WE HEREBY AMEND THIS CREDIT AS FOLLOWS:

IN THE PARAGRAPH BEGINNING "WE HEREBY ESTABLISH" IN SUB-PARAGRAPH (2) THAT PART READING "ISSUED UNDER AUTHORITY OF _____" IS HEREBY DELETED IN ITS ENTIRETY AND SUBSTITUTED BY: "ISSUED UNDER AUTHORITY OF THE U.S. NUCLEAR REGULATORY COMMISSION."

ALL OTHER CONDITIONS REMAIN UNCHANGED.

R Clem

AUTHORIZED SIGNATURE

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

August 1991

Mr. Bertram Wolfe
Vice President and General Manager
General Electric Company
175 Curtner Avenue
San Jose, California 95125

Dear Mr. Wolfe:

SUBJECT: RESPONSE TO FINANCIAL ASSURANCE SUBMITTAL OF MARCH 22, 1991

The U.S. Nuclear Regulatory Commission (NRC) has reviewed the March 22, 1991, General Electric Company (GE) financial assurance documents submitted to satisfy its compliance with the financial assurance requirements of the decommissioning rule. The submission is intended to assure decommissioning costs for licenses DPR-1; R-33; TR-1; DR-10; SNM-960; SNM-1097; 3400054-04; 3400054-05; SMB-191; STB-53; SUB-831; 37-02006-09; and 37-02006-05. The NRC staff requests GE to modify the submission to address the specific matters identified in the enclosure to this letter.

Should you have any questions, please contact Timothy Johnson on (301) 492-2055, Louis Bykoski on (301) 492-0572, or Michael Finkelstein, Office of the General Counsel, on 301-492-1623.

Robert M. Bernero, Director
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

REVIEW OF GENERAL ELECTRIC COMPANY FINANCIAL ASSURANCE
PACKAGE SUBMITTED MARCH 22, 1991

1. The three cost estimates (SUB-831), 37-020006-09, and 37-020006-05) totaling $800k is unsubstantiated. General Electric Company (GE) should document the cost estimates using the cost estimate tables in Appendix F, Regulatory Guide 3.66.

2. Decommissioning Cost Estimates for R-33 (NTR), TR-1 (GETR), DR-10 (EVESR), DPR-1 (VBWR):

   GE maintains that adjustments for inflation will be made every 5 years or when significant changes such as burial costs or changes in facility conditions occur. Regulatory Guide 1.159, page 7, states that for non-electric utility licensees who prepare a decommissioning cost estimate, adjustments to the cost estimate should be prepared annually, but need not be submitted to the Nuclear Regulatory Commission (NRC) staff. GE should prepare an annual adjustment to the decommissioning cost estimate for inspection by NRC staff.

3. Irrevocable Standby Letter of Credit:

   The blank space in subparagraph 2 should state "...under authority of the U.S. Nuclear Regulatory Commission."

4. Standby Trust Agreement:

   (Section 5) - The statement that "no withdrawal can exceed 100 percent of the outstanding balance" must be amended to "10 percent of the outstanding balance", pursuant to instructions issued to other material licensees.

Enclosure

GE Nuclear Energy

General Electric Company
175 Curtner Avenue, San Jose, CA 95125

April 4, 1991

030-06046
040-07344

Region I
US Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406
Attention: Regional Director

Region II
US Nuclear Regulatory Commission
101 Marietta Street, N.W. Suite 2900
Atlanta, GA 30323
Attention: Regional Director

Region III
US Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137
Attention: Regional Director

Region V
US Nuclear Regulatory Commission
1450 Maria Lane
Suite 210
Walnut Creek, CA 94596
Attention: Regional Director

Dear Sir/Madam:

Re: Financial Assurance for Decommissioning Nuclear Facilities (53 Fed. Reg. No. 123, pages 24019 et seq., 6/27/88)

Enclosed are copies of the financial assurance documents submitted by Dr. Bertram Wolfe, Vice President and General Manager, GE Nuclear Energy, on behalf of GE business components that operate facilities licensed by the NRC under Chapter I of Title 10 of the Code of Federal Regulation. The originals of these documents were personally delivered to Mr. John H. Austin, Chief, Decommissioning and Regulatory Issues Branch, LLW Division on March 22, 1991 at NRC's Washington, D. C. offices (White Flint).

Delivery was made in this manner in order to comply with the deadline arising out of the denial, on March 7, of GE's petition for reconsideration of the Commission's rejection of our request for an exception from the decommissioning rule's requirements for parent company guarantees.

OFFICIAL RECORD COPY

113058/113059
4/9/91

For your information, the March 22 meeting with Mr. Austin and representatives of the NRC's Office of General Counsel, which was also attended by representatives of Westinghouse Electric Corporation, was for the purpose, among other things, of discussing a possible petition for rule-making with regard to the relevant provision of the decommissioning rule.

If further information is needed, please let me know.

Sincerely,

Harry C. Burgess

Harry C. Burgess, Counsel
Technologies & Government Programs

HCB:e

cc: B. Wolfe

GE Nuclear Energy

Bertram Wolfe
Vice President and General Manager

[illegible]
175 Curtner Avenue, San Jose, CA 95125
[illegible]

March 22, 1991

Mr. Robert M. Bernero
Director
Office of Nuclear Material
Safety and Safeguards
U.S. Nuclear Regulatory Commission
One White Flint North Bldg.
11555 Rockville Pike
Rockville, Maryland 20852

Re: **Financial Assurance for Decommissioning Nuclear Facilities (53 Fed. Reg. No. 123, pages 24019 et seq., 6/27/88)**

Dear Mr. Bernero:

General Electric Company (GE) is in receipt of the Commission's response, dated March 7, denying our petition for reconsideration of the Commission's denial of a request for an exception from the financial assurance requirements of the NRC's Decommissioning Rule, effective July 27, 1988 (Rule). Pursuant to that notification, and in accordance with the provisions of the Rule, we are submitting to you herewith evidence of compliance with the financial assurance requirements for those facilities owned and operated by GE and licensed by the Nuclear Regulatory Commission under the applicable parts of Chapter I of Title 10 of the Federal Code of Regulations.

Financial assurance is being provided pursuant to a single mechanism; namely, a standby letter of credit from the Manufacturers Hanover Trust Company and an associated Standby Trust Agreement to receive funds when and if paid under the letter of credit. Since this single instrument provides financial assurance with respect to a number of GE facilities located in different NRC Regions and licenses under different Parts of Chapter I of Title 10, we are first submitting this package to you, with the originals of the financial documents, including a Certification of Financial Assurance covering all these facilities. Copies of these documents will be promptly submitted to each NRC Regional Office with jurisdiction over one or more of the listed licensed facilities for which financial assurance for decommissioning is provided by the Manufacturers Hanover letter of credit enclosed herewith.

We appreciate your cooperation in assuring that the documents submitted herewith come to the attention of the appropriate responsible personnel at the NRC Headquarters and are properly maintained there for future reference.

Very truly yours,

Bertram Wolfe

/ci
cc w/encl: Regional Administrator
NRC Regions I, II, III and V

MANUFACTURERS HANOVER

Manufacturers Hanover Trust Company
Geoserve Trade Services
4 New York Plaza
New York, NY 10004

DATE: MARCH 19,1991
PAGE NO.: 1

IRREVOCABLE STANDBY LETTER OF CREDIT NO. (b)(4)

THIS CREDIT EXPIRES: MARCH 22,1992

ISSUED TO: U.S. NUCLEAR REGULATORY COMMISSION;
WASHINGTON, DC 20555

DEAR SIR OR MADAM:

WE HEREBY ESTABLISH OUR IRREVOCABLE STANDBY LETTER OF CREDIT NO. (b)(4) IN YOUR FAVOR, AT THE REQUEST AND FOR THE ACCOUNT OF GENERAL ELECTRIC CO. 570 LEXINGTON AVE. NEW YORK, N.Y. 10022 ATTN: R.A. LATTERNER UP TO THE AGGREGATE AMOUNT OF THIRTY FIVE MILLION SIX HUNDRED THOUSAND U.S. DOLLARS (XXXX35,600,000.00 U.S. DOLLAR) AVAILABLE UPON PRESENTATION OF:

(1) YOUR SIGHT DRAFT, BEARING REFERENCE TO THIS LETTER OF CREDIT NO. (b)(4) AND
(2) YOUR SIGNED STATEMENT READING AS FOLLOWS: "I CERTIFY THAT THE AMOUNT OF THE DRAFT IS PAYABLE PURSUANT TO REGULATIONS ISSUED UNDER AUTHORITY OF _____."

THIS LETTER OF CREDIT IS ISSUED IN ACCORDANCE WITH REGULATIONS ISSUED UNDER THE AUTHORITY OF THE U.S. NUCLEAR REGULATORY COMMISSION ("NRC"), AN AGENCY OF THE U.S. GOVERNMENT, PURSUANT TO THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, AND THE ENERGY REORGANIZATION ACT OF 1974. THE NRC HAS PROMULGATED REGULATIONS IN TITLE 10, CHAPTER 1 OF THE CODE OF FEDERAL REGULATIONS, PART (30, 40, 70 OR 72), WHICH REQUIRE THAT A HOLDER OF, OR AN APPLICANT FOR, A LICENSE ISSUED UNDER 10 CFR PARTS (30, 40, 70 OR 72) PROVIDE ASSURANCE THAT FUNDS WILL BE AVAILABLE WHEN NEEDED FOR DECOMMISSIONING.

THIS LETTER OF CREDIT IS EFFECTIVE AS OF MARCH 22, 1991 AND SHALL EXPIRE ON MARCH 22,1992, BUT SUCH EXPIRATION DATE SHALL BE AUTOMATICALLY EXTENDED FOR A PERIOD OF ONE YEAR ON MARCH 22,1992 AND ON EACH SUCCESSIVE EXPIRATION DATE, UNLESS, AT LEAST 90 DAYS BEFORE THE THEN CURRENT EXPIRATION DATE, WE NOTIFY BOTH YOU AND GENERAL ELECTRIC CO., BY CERTIFIED MAIL, AS SHOWN ON THE SIGNED RETURN RECEIPTS. IF GENERAL ELECTRIC CO. IS UNABLE TO SECURE

CONTINUED

MANUFACTURERS HANOVER

Manufacturers Hanover Trust Company
Geoserve Trade Services
4 New York Plaza
New York, NY 10004

ALTERNATIVE FINANCIAL ASSURANCE TO REPLACE THIS LETTER OF CREDIT WITHIN 30 DAYS OF NOTIFICATION OF CANCELLATION THE NRC MAY DRAW UPON THE FULL VALUE OF THIS LETTER OF CREDIT PRIOR TO CANCELLATION. THE BANK SHALL GIVE IMMEDIATE NOTICE TO THE APPLICANT AND THE NRC OF ANY NOTICE RECEIVED OR ACTION FILED ALLEGING (1) THE INSOLVENCY OR BANKRUPTCY OF THE FINANCIAL INSTITUTION OR (2) ANY VIOLATIONS OF REGULATORY REQUIREMENTS THAT COULD RESULT IN SUSPENSION OR REVOCATION OF THE BANK'S CHARTER OR LICENSE TO DO BUSINESS. THE FINANCIAL INSTITUTION ALSO SHALL GIVE IMMEDIATE NOTICE IF THE BANK, FOR ANY REASON, BECOMES UNABLE TO FULFILL ITS OBLIGATION UNDER THE LETTER OF CREDIT.

WHENEVER THIS LETTER OF CREDIT IS DRAWN ON UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS LETTER OF CREDIT, WE SHALL DULY HONOR SUCH DRAFT UPON ITS PRESENTATION TO US WITHIN 30 DAYS, AND WE SHALL DEPOSIT THE AMOUNT OF THE DRAFT DIRECTLY INTO THE STANDBY TRUST FUND OF GENERAL ELECTRIC CO. IN ACCORDANCE WITH YOUR INSTRUCTIONS.

EACH DRAFT MUST BEAR ON ITS FACE THE CLAUSE: "DRAWN UNDER LETTER OF CREDIT NO. (b)(4) DATED MARCH 19,1991, AND THE TOTAL OF THIS DRAFT AND ALL OTHER DRAFTS PREVIOUSLY DRAWN UNDER THIS LETTER OF CREDIT DOES NOT EXCEED U.S.DOLLARS 35,600,000.00."

VERY TRULY YOURS,

KRISTINE SIEBEL
ASSISTANT VICE PRESIDENT
MARCH 19,1991

THIS CREDIT IS SUBJECT TO THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS (1983 REVISION) INTERNATIONAL CHAMBER OF COMMERCE PUBLICATION NO. 400.

MANUFACTURERS HANOVER

Manufacturers Hanover Trust Company
Geoserve Trade Services
4 New York Plaza
New York, NY 10004

DATE OF AMENDMENT MARCH 21,1991	AMENDMENT TO IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER (b)(4)
APPLICANT: GENERAL ELECTRIC CO. 570 LEXINGTON AVE. NEW YORK, N.Y. 10022 ATTN: R.A. LATTERNER	BENEFICIARY: U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, D.C. 20555
ADVISING BANK:	AMENDMENT SEQUENCE NUMBER 501 THIS AMENDMENT IS TO BE CONSIDERED AS PART OF THE ABOVE MENTIONED CREDIT AND MUST BE ATTACHED THERE TO:

WE HEREBY AMEND THIS CREDIT AS FOLLOWS:

IN THE PARAGRAPH BEGINNING QUOTE THIS LETTER OF CREDIT IS ISSUED UNQUOTE THAT PART READING QUOTE PART (30, 40, 70 OR 72), UNQUOTE IS HEREBY DELETED AND SUBSTITUTED BY QUOTE PART 30, 40, 50 OR 70, UNQUOTE

ADDITIONALLY IN THE SAME PARAGRAPH, THAT PART READING QUOTE 10 CFR PARTS (30, 40, 70 OR 72) UNQUOTE IS HEREBY DELETED AND SUBSTITUTED BY QUOTE 10 CFR PARTS 30, 40, 50, OR 70 UNQUOTE

ALL OTHER CONDITIONS REMAIN UNCHANGED.

AUTHORIZED SIGNATURE

KRISTINE SIEBEL
ASSISTANT VICE PRESIDENT

Certificate
of
Manufacturers Hanover Trust Company

I, HAROLD FUDALI, a Trust Officer of Manufacturers Hanover Trust Company (the "Trustee"), hereby certify as follows:

1. The Trust Agreement, dated as of MARCH 22, 1991 (the "Trust Agreement"), between GENERAL ELECTRIC CO. (the "GRANTOR"), XXXX

ACKNOWLEDGEMENT

STATE OF New York

To Wit: _____

CITY OF New York

On this 20th day of March, 1991, before me, a notary public in and for the city and State aforesaid, personally appears John Sciacchitano, and she/he did depose and say that she/he is the Vice Pres of Manufacturers Hanover Trust Company, a N.Y. banking corporation Trustee, which executed the above instrument, that she/he knows the seal of said association; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the association; and that she/he signed her/his name thereto by like order.

ROBERT J. STANISLARO
Notary Public, State of New York
No. 43-4968697
Qualified in Richmond County
Certificate filed in New York County
Commission Expires July 2, 1992

Robert J. Stanislaro
[Signature of notary public]

My Commission Expires: 7/2/92
[Date]

SIGNATURE RESOLUTION

MANUFACTURERS HANOVER TRUST COMPANY

NEW YORK, NY 10017

It Is Hereby Certified that the following resolution has been duly adopted by the Board of Directors of Manufacturers Hanover Trust Company and is in full force and effect at the date hereof:

Resolved That:

1. Whenever in this resolution used (a) the term "officer" shall mean any of the following: the Chairman of the Board, the President, an Executive Vice Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, Senior Vice President or Vice President, the Controller, the Secretary, a Deputy General Counsel, a Deputy Controller, an Assistant Vice President, Assistant Controller, Associate Counsel, Assistant Secretary, Trust Officer, Assistant Counsel, Accounting Officer, Manager or Assistant Manager of the Company; and (b) the term "holder of per procuration authority" shall mean an employee of the Company to whom a special signing authority has been granted pursuant to this resolution.

2. The Personnel Policy Committee be and it hereby is granted continuing authority to appoint employees of the Company as holders of per procuration authority in such manner, with such signature authority and designations, and subject to such limitations as it may determine.

3. The following shall bear the signature of one officer:
   - A. CHECKS or DRAFTS drawn on or ORDERS issued to domestic correspondents or depositaries of the Company involving the withdrawal, payment or transfer of funds: EXCEPT that CHECKS or DRAFTS drawn on or ORDERS issued to domestic depositaries of the Company involving the withdrawal, payment or transfer of funds with respect to accounts in the name of the Company in any fiduciary capacity, shall be signed by any one of the officers so designated to each such domestic depositary, such designation to be in writing signed by an officer above the rank of Assistant Vice President and bearing the corporate seal of the Company duly attested.
   - B. with respect to transactions payable or to be consummated within the United States of America, ORDERS for the exchange, transfer or delivery of securities, documents, merchandise or other property, ADVICES involving orders for the withdrawal, payment or transfer of funds and all correspondence relating thereto except that ADVICES with respect to transactions on the Security Movement and Control System of the Operations Division of the Company shall not require any signature provided that the RELEASE FORM for any such transaction shall bear the signature of one officer or one holder of Per Procuration authority so authorized.
   - C. CERTIFICATES OF DEPOSIT, except that INCOME CERTIFICATES OF DEPOSIT shall be signed by two officers or by one officer and a holder of per procuration authority so authorized.
   - D. CERTIFICATIONS of requests for payment, or witnessing of assignments on United States Treasury securities.
   - E. GUARANTEES with respect to missing or irregular shipping documents.
   - F. CONFIRMATIONS of contracts entered into by the Company for the purchase or sale of foreign exchange for future delivery.
   - G. TRAVELERS LETTERS OF CREDIT.
   - H. BEARER DEPOSITORY RECEIPTS for BANKERS ACCEPTANCES.

4. The following shall bear the signature of one officer or one holder of per procuration authority so authorized:
   - A. CHECKS, DRAFTS, MONEY ORDERS or other ORDERS for the payment of funds drawn on the Company.
   - B. RECEIPTS for money, securities or other property, other than routine receipts signed by employees whose usual duties involve the signing thereof.
   - C. CERTIFICATIONS of checks, drafts and other orders for the payment of funds drawn on the Company.
   - D. ENDORSEMENTS of checks, drafts, bills of exchange, notes, bankers acceptances, trade acceptances, stocks, bonds, debentures, warehouse receipts, bills of lading, insurance certificates or policies, title documents covering merchandise and all other documents or instruments requiring signed endorsements of the Company.
   - E. GUARANTEES OF ENDORSEMENTS OR ASSIGNMENTS of checks, drafts, bills of exchange, notes, bankers acceptances, trade acceptances, stocks, bonds, debentures, warehouse receipts, bills of lading, insurance certificates or policies, title documents covering merchandise and all OTHER DOCUMENTS or instruments requiring signed guarantees of endorsements or guarantees by the Company of other signatures.
   - F. AUTHENTICATIONS and OTHER CERTIFICATES to be signed by the Company as trustee, fiscal agent or otherwise under any mortgage, deed of trust or other instrument pursuant to which bonds, debentures, notes or other obligations of any corporate or other obligor, or of any country, state, public agency or political subdivision are issued; stock certificates, voting trust certificates, warrants, scrip certificates, receipts, advices or other documents and instruments to be executed or countersigned by the Company as registrar, transfer agent or in any other representative or agency capacity; interim receipts or trust certificates issued by the Company in its individual or in any representative or fiduciary capacity; affidavits, statements, letters of transmittal or assent, petitions and other documents and instruments relating to probate or administration of estates or trusts and OTHER DOCUMENTS, instruments or correspondence to be executed by the Company as executor, trustee or in any other representative or fiduciary capacity.
   - G. DRAFTS drawn on or ORDERS issued to foreign correspondents or depositaries of the Company involving the withdrawal, payment or transfer of funds, and ADVICES thereof.
   - H. With respect to transactions payable or to be consummated outside the United States of America, ORDERS for the exchange, transfer or delivery of securities, documents, merchandise or other property, ADVICES involving orders for the withdrawal, payment or transfer of funds, and all correspondence relating thereto.
   - I. COMMERCIAL LETTERS OF CREDIT AND ACCEPTANCES.
   - J. CHECKS or DRAFTS drawn on or ORDERS or INSTRUCTIONS issued to the Federal Reserve Bank of New York with respect to work performed by the Brokers and Dealers Clearance section of the Company's Operations Division involving the withdrawal, payment or transfer of funds or securities.

5. CERTIFICATES, STATEMENTS and VERIFICATIONS advising the status of customers' accounts and correspondence relating thereto shall bear the signature of one officer or the signature of the General Auditor, Deputy General Auditor or a Deputy Auditor, Assistant Auditor, Regional Auditor or Audit Officer, or a holder of per procuration authority so authorized.

6. RECONCILEMENTS OF ACCOUNTS of the Company with others shall bear the signature of the General Auditor, Deputy General Auditor or a Deputy Auditor, Assistant Auditor, Regional Auditor or Audit Officer.

7. DOCUMENTS issued by or executed on behalf of the Company at an overseas branch shall be signed in the following manner:
   - A. The following shall bear the signature of any of the following: the Chairman of the Board, the President, an Executive Vice Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, Senior Vice President, Manager and Vice President, the Controller, the Secretary, a Deputy Controller, and Assistant Vice President, an Assistant Secretary, a Manager, Manager and Representative, Deputy Manager, Assistant Manager, Sub-Manager or Regional Controller.
     1. CHECKS or DRAFTS drawn on or ORDERS issued to foreign correspondents or depositaries of the Company involving the withdrawal, payment or transfer of funds.
     2. ORDERS for the exchange, transfer or delivery of securities, documents, merchandise or other property.
     3. GUARANTEES with respect to missing or irregular shipping documents.
     4. CONFIRMATIONS of contracts entered into by the Company for the purchase or sale of foreign exchange for future delivery.
     5. TRAVELERS LETTERS OF CREDIT.
     6. CERTIFICATES OF DEPOSIT.
   - B. The following shall bear the signature of any of the officers or persons holding other titles mentioned in subparagraph A hereof or a holder of per procuration authority so authorized:
     1. CHECKS, DRAFTS or other ORDERS for the payment of funds drawn on the Company and checks and bankers payment orders drawn by any of the Company's overseas branches on depositary banks in the country in which such overseas branch is located.

2. COMMERCIAL LETTERS OF CREDIT and ACCEPTANCES.

3. ENDORSEMENTS of checks, notes, drafts, acceptances, warehouses receipts, bills of lading, insurance policies or certificates and other instruments requiring the signed endorsement of the Company (other than assignments of certificates of stock, bonds or other securities).

4. GUARANTEES of endorsements and other signatures.

5. ADVICES of checks or drafts; RECEIPTS; RELEASES; ASSIGNMENTS (other than assignments of certificates of stock, bonds or other securities) and PROXIES.

6. AUTHENTICATIONS and OTHER CERTIFICATES to be signed by the Company as trustee, fiscal agent or otherwise under any mortgage, deed of trust or other instrument pursuant to which bonds, debentures, notes or other obligations of any corporate or other obligor, or of any country, state, public agency or political subdivision are issued; stock certificates, voting trust certificates, warrants, scrip certificates, receipts, advices or other documents and instruments to be executed or countersigned by the Company as registrar, transfer agent or in any other representative or agency capacity; interim receipts or trust certificates issued by the Company in its individual or in any representative or fiduciary capacity; affidavits, statements, letters of transmittal or assent, petitions and other documents and instruments relating to probate or administration of estates or trusts and OTHER DOCUMENTS, instruments or correspondence to be executed by the Company as executor, trustee or in any other representative or fiduciary capacity.

C. The following shall bear the signature of the Auditor-Europe, Regional Auditor or any of the officers or persons holding other titles mentioned in subparagraph A hereof or a holder of per procuration authority so authorized:
Certificates or statements advising the status of customers' accounts at an overseas branch, verifications of customers' accounts and correspondence relating thereto.

D. The following shall bear the signature of the Auditor-Europe, Regional Auditor or a holder of per procuration authority so authorized or an officer so authorized by the Personnel Policy Committee:
Reconcilements of an overseas branch's accounts with others.

8. The Chairman of the Board, the President, an Executive Vice Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, Senior Vice President or Vice President, the Controller, the Secretary, a Deputy General Counsel or an Assistant Vice President or Associate Counsel be and each of them hereby is authorized for and on behalf of the Company, acting in its individual or in any representative or fiduciary capacity, to SELL, assign, transfer or exercise any rights with respect to any STOCK, BONDS OR OTHER SECURITIES, choses in action or personal property now or hereafter generally standing in the name of the Company and held by it for itself or in any representative, fiduciary or other capacity whatsoever and, in connection therewith, to execute and deliver any and all transfers, conveyances, endorsements, assignments, powers of attorney, revocations, substitutions, releases, agreements, proxies and consents and, when required, may affix the seal of the Company thereto and may make, execute and deliver under the seal of the Company any and all instruments in writing necessary or proper for such purposes.

9. The Chairman of the Board, the President, an Executive Vice Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, Senior Vice President, the Controller, the Secretary, a Deputy General Counsel be and each of them hereby is, or any Vice President, Assistant Vice President or Associate Counsel together with any other officer, be and they hereby are, authorized for and on behalf of the Company to PLEDGE, hypothecate or deposit any securities owned by the Company as security for any statutory liability or obligation of the Company, and to execute and deliver orders for the withdrawal, delivery or substitution of securities owned by the Company and held as security or otherwise by any public official, governmental authority or instrumentality or secured depositor, or by any depositary (including divisions or departments of the Company) for any public official, governmental authority or instrumentality or secured depositor.

10. The Chairman of the Board, the President, an Executive Vice Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, Senior Vice President or Vice President, the Controller, the Secretary, a Deputy General Counsel or an Assistant Vice President, Associate Counsel or Trust Officer be and each of them hereby is authorized for and on behalf of the Company to EXECUTE and deliver any and all INDENTURES, deeds of trust, corporate mortgages, agency agreements, custodial agreements, depository agreements, assignments, affidavits, certificates, releases, satisfactions, applications, petitions and any OTHER DOCUMENTS or instruments in connection with the operations of the Company in any trust, agency, representative or other fiduciary capacity, and, when required, may affix the seal of the Company thereto.

11. The Chairman of the Board, the President, an Executive Vice Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, Senior Vice President or Vice President, the Controller, the Secretary, a Deputy General Counsel or an Assistant Vice President, assigned to the Personal Trust Sector of the Private Banking and Securities Industry Division, the Real Estate and Mortgage Department or the Branch Real Estate/Property Management Department be and each of them hereby is authorized for and on behalf of the Company acting in its individual or in any representative or fiduciary capacity, to EXECUTE, acknowledge and deliver any and all CONTRACTS OF SALE or exchange, DEEDS, releases, assignments, extension agreements, modification agreements, participation agreements and certificates, building loan agreements, escrow agreements, mortgagee certificates, instruments of acceptance, ratification or satisfaction, instruments required by or intended for any governmental or other public body with respect to real estate mortgage transactions, proxies to vote stock in corporations whose principal business consists of owning or dealing in real property, or other DOCUMENTS, of any description RELATING TO REAL PROPERTY, and also bills of sale or other instruments relating to personal property so far as the same are incidental to real estate or real estate mortgage transactions.

12. The Chairman of the Board, the President, an Executive Vice Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, Senior Vice President, Vice President, or an Assistant Vice President, other than Assistant Vice President assigned to the Institutional Trust and Agency Division or the Personal Trust Sector of the Private Banking and Securities Industry, or an Associate Counsel be and each of them hereby is authorized for and on behalf of the Company to execute LOAN COMMITMENTS AND LOAN AGREEMENTS and other documents or instruments relating to loan and discount transactions entered into by the Company.

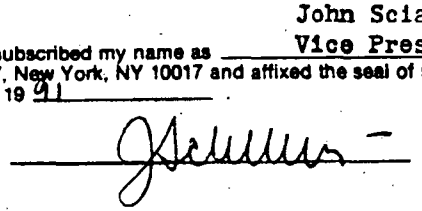
13. Any and ALL DOCUMENTS or instruments not mentioned in this resolution which may be necessary or appropriate to the conduct of the lawful business of the Company, either in its individual or in any representative, fiduciary or other capacity whatsoever, may be executed for and on behalf of the Company by the Chairman of the Board, the President, an Executive Vice Chairman of the Board, a Vice Chairman of the Board, an Executive Vice President, Senior Vice President or Vice President, a Deputy General Counsel, the Controller or the Secretary, and, when required, any such officer may affix the seal of the Company thereto.

14. Any of the foregoing documents or instruments may bear the FACSIMILE SIGNATURE of an officer or holder of per procuration authority when authorized by the Personal Policy Committee.

15. The Secretary, an Assistant Secretary or Trust Officer or an Associate Counsel or Assistant Counsel, or, a Vice President or Assistant Vice President assigned to the Corporate Trust Sector of the Institutional Trust and Agency Division or, at an overseas branch, a Vice President, Manager and Vice President, Manager and Representative, Manager, Assistant Secretary, Deputy Manager, Assistant Manager or Sub-Manager and each of them hereby is authorized, when necessary or appropriate, to affix or cause to be affixed, either manually or by facsimile, the CORPORATE SEAL of the company to any document or instrument executed pursuant to this resolution and to attest to the corporate seal so affixed thereto; provided, however, that no such officer shall attest to the corporate seal of the Company affixed to any document or installment signed by him.

16. Any and all general resolutions authorizing the signing of documents or instruments for or on behalf of the Company heretofore adopted by the Board of Directors of the Company which are inconsistent or in conflict with this resolution be and they hereby are rescinded.

In Witness Whereof, I have hereunto subscribed my name as John Sciacchitano Vice President of MANUFACTURERS HANOVER TRUST COMPANY, New York, NY 10017 and affixed the seal of said Company, this 20th day of March, 1991.



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ACKNOWLEDGEMENT

STATE OF New York

To Wit: _____

CITY OF New York

On this 20th day of March, 1991, before me, a notary public in and for the city and State aforesaid, personally appears John Sciacchitano, and she/he did depose and say that she/he is the Vice Pres of Manufacturers Hanover Trust Company, a N.Y. banking corporation Trustee, which executed the above instrument, that she/he knows the seal of said association; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the association; and that she/he signed her/his name thereto by like order.

ROBERT J. STANISLAWO
Notary Public, State of New York
No. 43-4933937
Qualified in Richmond County
Certificate filed in New York County
Commission Expires July 2, 1992

Robert J. Stanislaw
[Signature of notary public]

My Commission Expires: 7/2/92
[Date]

MANUFACTURERS HANOVER

Matthew J. Trachtenberg
Vice President and Corporate Secretary

Manufacturers Hanover Trust Company

270 Park Avenue
New York, NY 10017

This is to certify that KRISTINE V. SIEBEL is a duly elected Assistant Vice President of Manufacturers Hanover Trust Company and is presently acting in such capacity.

Assistant Secretary

March 19, 1991

State of New York,

Banking Department

I, **DONALD J. KAVANAGH**, Deputy Superintendent of Banks of the State of New York, **DO HEREBY CERTIFY:**

THAT, MANUFACTURERS HANOVER TRUST COMPANY is a corporation organized and existing under the laws of the State of New York and has its principal office and place of business at 270 Park Avenue, Borough of Manhattan, City of New York, New York; and

THAT, MANUFACTURERS HANOVER TRUST COMPANY is validly existing as a banking organization under the laws of the State of New York, and has all the powers of a trust company as specified under Article III of the Banking Law of the State of New York, and is authorized to transact a trust and banking business in the State of New York.

Witness, *my hand and official seal of the Banking Department at the City of New York, this* 4th *day of* September *in the Year of our Lord one thousand nine hundred and* ninety

Deputy *Superintendent of Banks.*

Enclosure to GE letter
March 22, 1991
Financial Assurance for
Decommissioning Nuclear
Facilities

GENERAL ELECTRIC COMPANY

Certificate of Incorporation and By-laws

APB-9G(5/88)

Certificate of Incorporation and By-laws

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CERTIFICATE OF INCORPORATION

OF

GENERAL ELECTRIC COMPANY *

Section 1. *NAME*

The name of the corporation is General Electric Company.

Section 2. *PURPOSES*

The purposes of the corporation are as follows:

A. To manufacture, process, construct, develop, assemble, and produce in any way, to sell, lease, supply, and distribute in any way, to purchase, lease, mine, extract, and acquire in any way, to own, operate, experiment with, deal in, service, finance, and use in any way, equipment, apparatus, appliances, devices, structures, materials, processes, information, tangible and intangible property, services and systems of every kind, nature and description:

(1) for any electrical, or energy-conversion, application or purpose, including but not limited to the production, transmission, distribution, storage, regulation, control and use in any manner of electricity, or in any way connected with or deriving from any electrical, or energy-conversion, application or purpose, and,

(2) for any other application or purpose, whatsoever, including but not limited to industrial, utility, consumer, defense, governmental, scientific, educational, cultural, financial, recreational, agricultural, transportation, construction, mining, and communication applications or purposes.

B. To conduct studies and research and development, and to engage in any other activity relating to the development, application, and dissemination of information concerning science, technology, and other fields of endeavor.

C. To acquire by purchase, subscription or otherwise all or part of any interest in the property, assets, business, or good will of any

* Text of Certificate of Incorporation as set forth in Restated Certificate of Incorporation filed by the Department of State of New York on April 30, 1965. Section 3.A. was subsequently amended on April 29, 1971, to change the authorized number of common shares from 105,000,000 shares with a par value of $5 to 210,000,000 shares with a par value of $2.50, on December 20, 1976, to change the authorized number of common shares, par value $2.50, from 210,000,000 shares to 251,500,000 shares, on April 27, 1983, to change the authorized number of common shares, par value $1.25, from 251,500,000 shares to 550,000,000 shares and on April 23, 1987, to change the authorized number of common shares, par value $0.63, from 550,000,000 shares to 1,100,000,000 shares; and to change the authorized number of preferred shares, par value $1, from 2,000,000 to 50,000,000 shares. Section 3.C. relating to preemptive rights was added by amendment effective May 2, 1975. Section 6 relating to Directors was amended effective April 28, 1988, to limit their personal liability to the corporation and its shareholders. General Electric Company was created by a Special Act of the New York Legislature, Chapter 323, Laws of 1892, effective April 15, 1892.

corporation, association, firm, or individual, and to dispose of, or otherwise deal with, such property, assets, business or good will.

D. To engage in any activity which may promote the interests of the corporation, or enhance the value of its property, to the fullest extent permitted by law, and in furtherance of the foregoing purposes to exercise all powers now or hereafter granted or permitted by law, including the powers specified in the New York Business Corporation Law.

Section 3. *AUTHORIZED SHARES*

A. *General Authorization*

The aggregate number of shares which the corporation is authorized to issue is 1,150,000,000 shares, consisting of:

(1) 1,100,000,000 shares of common stock having a par value of $0.63 per share; and

(2) 50,000,000 shares of preferred stock having a par value of $1 per share.

B. *Preferred Stock*

(1) The Board of Directors is authorized, subject to limitations prescribed by law and the provisions of this subsection B, to provide for the issuance of the preferred shares in series, and by filing a certificate pursuant to the Business Corporation Law, to establish the number of shares to be included in each such series, and to fix the designation, relative rights, preferences and limitations of the shares of each such series. The authority of the Board with respect to each series shall include, but not be limited to, determination of the following:

(a) The number of shares constituting that series and the distinctive designation of that series;

(b) The dividend rate on the shares of that series, whether dividends shall be cumulative and, if so, from which date or dates;

(c) Whether that series shall have voting rights, in addition to the voting rights provided by law and, if so, the terms of such voting rights;

(d) Whether that series shall have conversion privileges and, if so, the terms and conditions of such conversion, including provision for adjustment of the conversion rate in such events as the Board of Directors shall determine;

(e) Whether or not the shares of that series shall be redeemable, and, if so, the terms and conditions of such redemption, including the date or dates upon or after which they shall be redeemable, and the amount per share payable in case of redemption, which amount may vary under different conditions and at different redemption dates;

(f) The rights of the shares of that series in the event of voluntary or involuntary liquidation, dissolution or winding up of the corporation;

(g) Any other relative rights, preferences and limitations of that series.

(2) Dividends on outstanding preferred shares shall be declared and paid, or set apart for payment, before any dividends shall be declared and paid, or set apart for payment, on the common shares with respect to the same dividend period.

C. *Preemptive Rights*

No present or future holder of any shares of the corporation of any class or series, whether heretofore or hereafter issued, shall have any preemptive rights with respect to (1) any shares of the corporation of any class or series, or (2) any other security of the corporation (including bonds and debentures) convertible into or carrying rights or options to purchase such shares.

Section 4. *OFFICE*

The office of the corporation is located in the City of Schenectady, County of Schenectady, State of New York.

Section 5. *BY-LAWS*

The by-laws may be amended or repealed, and new by-laws may be adopted, by the shareholders or the Board of Directors, except that the Board of Directors shall have no authority to amend or repeal any by-law which is adopted by the shareholders after April 20, 1948, unless such authority is granted to the Board by the specific provisions of a by-law adopted by the shareholders.

Section 6. *DIRECTORS*

The Board of Directors of the corporation shall consist of not less than fifteen nor more than twenty-one directors, the number to be determined, within these limits, as prescribed by the by-laws.

A person who is or was a director of the corporation shall have no personal liability to the corporation or its shareholders for damages for any breach of duty in such capacity except that the foregoing shall not eliminate or limit liability where such liability is imposed under the Business Corporation Law of the State of New York.

Section 7. *AGENT FOR PROCESS*

The Secretary of State of the State of New York is designated as the agent of the corporation upon whom process against it may be served, and the post office address to which the Secretary of State shall mail a copy of such process served upon him is Corporate Legal Operation, 1 River Road, Schenectady, New York 12305.

BY-LAWS

OF

GENERAL ELECTRIC COMPANY *

ARTICLE I

OFFICE

The office of this Company shall be in the City of Schenectady, County of Schenectady, State of New York.

ARTICLE II

DIRECTORS

A. The stock, property and affairs of this Company shall be managed by a Board of Directors consisting of not less than fifteen nor more than twenty-one members. The number of Directors shall be such number, within the aforesaid minimum and maximum limits, as shall be determined by vote of a majority of the entire Board of Directors, except as the number of Directors for any year shall be fixed by the shareholders at any annual statutory meeting by a majority vote of the outstanding shares entitled to vote thereon. The Directors shall be elected each year, at the annual statutory meeting of the shareholders, to hold office until the next annual statutory meeting, and until their successors have been elected and have qualified. One-third of the number of Directors constituting the entire Board, as that number shall be determined from time to time, shall be a quorum for the transaction of business.

B. Meetings of Directors

1. The Board of Directors may fix the time or times and the place or places of regular and special meetings of the Board. Special meetings of the Directors also may be held at any time by order of the Chairman of the Board, or in the absence of the Chairman of the Board, by order of the President, if then a separate officer, or upon the written direction of two of the Directors.
2. Notice of each special meeting shall be mailed or telegraphed to each Director at his residence or place of business at least two days before the meeting, and notice shall be deemed to be given at the time of mailing or delivery to a telegraph office for transmission, but the said two days' notice need not be given to any Director who submits a signed waiver of notice, whether before or after the meeting, or who attends the meeting without

* As last amended and restated by Board of Directors on September 10, 1976, except for Article XI which was amended by shareholders on April 22, 1987.

protesting prior thereto or at its commencement, the lack of notice to him. If the time and place of a regular meeting have not been fixed by the Board, notice of such meeting shall be given as in the case of a special meeting.

3. The Board of Directors may prescribe an order of business for its meetings.
4. Any action required or permitted to be taken by the Board of Directors or any committee thereof may be taken without a meeting if all members of the Board or the committee consent in writing to the adoption of a resolution authorizing the action. The resolution and the written consent thereto by the members of the Board or committee shall be filed with the minutes of the proceedings of the Board or committee.
5. Any one or more members of the Board of Directors or of any committee of the Board of Directors may participate in a meeting of such Board or committee by means of a conference telephone or similar communications equipment allowing all persons participating in the meeting to hear each other at the same time. Participation by such means shall constitute presence in person at any such meeting.

C. In respect to things not herein specially provided for, the Board of Directors may exercise the powers conferred on them by law.

ARTICLE III

COMMITTEES OF DIRECTORS

The Board of Directors, by resolution adopted by a majority of the entire Board, may designate from among its members, a Management Development and Compensation Committee, an Audit Committee, a Finance Committee, an Operations Committee, a Public Responsibilities Committee, a Technology and Science Committee, and other committees, each consisting of three or more directors, and each of which, to the extent provided in the applicable resolution, shall have all the authority of the Board to the fullest extent permitted by law. The Board may designate one or more directors as ex officio members of any such committee who may replace any absent member or members at any meeting of such committee.

ARTICLE IV

OFFICERS

A. As determined by the Board of Directors, the officers of this Company shall include:

1. A Chairman of the Board, who shall be chosen by the Directors from their own number. The Chairman of the Board shall be the Chief Executive Officer of the Company and in that capacity shall have general management, subject to the control of the Board of Directors, of the business of the Company, including

the appointment of all officers and employees of the Company for whose election or appointment no other provisions is made in these By-laws; he shall also have the power, at any time, to discharge or remove any officer or employee of the Company, subject to the action thereon of the Board of Directors, and shall perform all other duties appropriate to this office. The Chairman of the Board shall preside at all meetings of Directors, and he may at any time call any meeting of the Board of Directors; he may also at his discretion call or attend any meeting of any committee of the Board, whether or not a member of such committee.

2. One or more Vice Chairmen of the Board, who shall also be chosen by the Directors from their own number. The Board may designate one or more of the Vice Chairmen to be Executive Officers of the Company accountable to the Chief Executive Officer.
3. A President of the Company, who shall be chosen by the Directors from their own number. The office of President will normally be vested in the Chairman of the Board, provided, however, that in the discretion of the Board, the position of President may be established independent of, but accountable to, the Chairman during transition periods.
4. Two or more Vice Presidents, one or more of whom may also be designated Executive Vice Presidents or Senior Vice Presidents accountable to the Chief Executive Officer.
5. A Vice President — Finance, who shall be the principal financial officer of the Company, and who shall have such duties as the Board, by resolution, shall determine. In the absence or disability of the Vice President — Finance, the Chairman of the Board may designate a person to exercise the powers of such office.
6. A Comptroller and a Treasurer who shall be officers of the Company. The Treasurer and Comptroller shall perform such duties as may be assigned by the Vice President — Finance. In the absence or disability of the Comptroller or Treasurer, the Chairman of the Board may designate a person to execute the powers of such office.
7. A Secretary, who shall record in proper books to be kept for that purpose and have custody of the minutes of the meetings of the shareholders of the Company and of meetings of the Board of Directors and of committees of the Board (other than the Compensation Committee) and who shall be responsible for the custody and care of the seal of the Company. He shall attend to the giving and serving of all notices of the Company and perform such other duties as may be imposed upon him by the Board of Directors.

The Secretary may appoint an Associate Secretary and Attesting Secretaries, each of whom shall have the power to affix and attest the corporate seal of the Company, and to attest the execution of documents on behalf of the Company and who shall perform such other duties as may be assigned by the Secretary; and in the absence or disability of the Secretary, the Associate Secretary may be designated by the Chairman to exercise the powers of the Secretary.

8. Such other officers as the Board may from time to time appoint.

B. One person may hold two or more offices, except that no person shall simultaneously hold the offices of President and Secretary.

C. All officers shall be elected by the Board of Directors for an initial term which shall continue until the first Board meeting following the next annual statutory meeting of shareholders, and thereafter all officers shall be elected for one-year terms; provided, however, that all officers shall serve at the pleasure of the Board. Officers shall exercise such powers and perform such duties as the Chief Executive Officer may from time to time direct, provided that these powers and duties are not inconsistent with any outstanding Board resolutions.

D. In the event of the absence, incapacity, illness or the death of the Chairman of the Board, the President, if then a separate officer, shall assume the duties of the Chairman of the Board pending action by the Board of Directors; provided, however, that if there is not a separate President in office, the duties of the Chairman of the Board, pending action by the Board of Directors, shall be assumed by that Vice Chairman who is senior to the others in length of General Electric Company service.

ARTICLE V

REMOVAL OF OFFICERS AND EMPLOYEES

A. Any officer or employee of the Company may be at any time removed by the affirmative vote of at least a majority of the Board of Directors. In case of such removal the officer so removed shall forthwith deliver all the property of the Company in his possession, or under his control, to some person to be designated by the Board. Nothing herein contained shall limit the power of any officer to discharge any subordinate.

B. The Board may at any time, in the transaction of business, temporarily delegate any of the duties of any officer to any other officer or person selected by it.

ARTICLE VI

VACANCIES

Any vacancy occurring in the Board of Directors, or in any office, may be filled for the unexpired term by the Board of Directors.

ARTICLE VII

MEETINGS OF SHAREHOLDERS

Meetings of shareholders may be held at such time and in such place within or without the State of New York as the Board of Directors may determine, and the annual statutory meeting required by Section 602(b) of the New York Business Corporation Law shall be held on the fourth Wednesday in April of each year, or as the Board of Directors may from time to time otherwise determine.

Special meetings of the shareholders may be called by the Board, or upon the written request therefor of shareholders holding forty percent of the then issued stock of the Company, filed with the Secretary.

The Board of Directors may prescribe an order of business for meetings of shareholders. The Chairman of the Board, or in his absence, the President, if then a separate officer, shall preside at meetings of the shareholders; provided, however, that the Board of Directors may for any meeting of shareholders designate another officer or officers to preside.

ARTICLE VIII

STOCK AND TRANSFER

A. Certificates of stock, signed by the Chairman of the Board, or a Vice Chairman, or the President, if then a separate officer, or a Vice President and the Secretary or Treasurer, shall be issued to the shareholders. Such signatures may be facsimiles, engraved or printed, and in case any such officer who has signed or whose facsimile signature has been placed upon a certificate shall have ceased to be such before such certificate is issued, such certificate may be issued by the Company with the same effect as if that officer had not ceased to be such at the date of its issue.

B. The stock shall be transferable only upon the books of the Company, by the holder thereof, in person, or by properly authenticated power of attorney.

C. The Board of Directors or Executive Committee may appoint suitable agents in the City of New York and elsewhere, to facilitate transfers by shareholders under such regulations as the Board may from time to time prescribe. The transfer books may be closed by the Board for such periods as may be deemed advisable for dividend or other purposes.

D. The Board of Directors or Executive Committee may appoint any Bank or Trust Company in the City of New York or elsewhere, to act as registrar of transfers of stock until otherwise ordered by the Board of Directors. After the appointment of any such registrar of transfers, no certificate thereafter issued for stock shall be binding upon the Company, or have any validity, unless countersigned by any such registrar of transfers, or by a successor of any such registrar appointed by the Board of Directors.

E. The Board of Directors may make such other and further regulations, with reference to the stock and its transfer, as to them may seem advisable from time to time.

F. The Board of Directors may call a meeting or meetings of shareholders for the purpose of authorizing an increase of the stock of this Company, at such time or times as to the Board may seem advisable.

ARTICLE IX

EXAMINATION OF BOOKS

The Board of Directors may, by resolution, make regulations respecting the examination of the books of the Company by shareholders.

ARTICLE X

ENGINEERING DECISIONS AND ACTIVITIES

All engineering decisions made in a particular state pertaining to any project or engineering activities conducted by the Company in such state where so required by law, or where the Chief Executive Officer so directs, shall be made (a) by the employee of the Company who holds a certificate of registration as an engineer in such state and who has been specified by the Chief Executive Officer or the person designated by the Chief Executive Officer to make such specification, as the engineer in responsible charge of such project or engineering activities, or (b) by other responsible engineers under his direction or supervision.

ARTICLE XI

INDEMNIFICATION

A. The Company shall, to the fullest extent permitted by applicable law as the same exists or may hereafter be in effect, indemnify any person who is or was or has agreed to become a director or officer of the Company and who is or was made or threatened to be made a party to or is involved in any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, including an action by or in the right of the Company to procure a judgment in its favor and an action by or in the right of any other corporation of any type or kind, domestic or foreign, or any partnership, joint venture, trust, employee benefit plan or other enterprise, which such person is serving, has served or has agreed to serve in any capacity at the request of the Company, by reason of the fact that he or she is or was or has agreed to become a director or officer of the Company, or is or was serving or has agreed to serve such other corporation, partnership, joint venture, trust, employee benefit plan or other enterprise in any capacity, against judgments, fines, amounts paid or to be paid in settlement, taxes or penalties, and costs, charges and expenses, including attorney's fees, incurred in connection with such action or proceeding or any appeal therein; provided, however, that no

indemnification shall be provided to any such person if a judgment or other final adjudication adverse to the director or officer establishes that (i) his or her acts were committed in bad faith or were the result of active and deliberate dishonesty and, in either case, were material to the cause of action so adjudicated, or (ii) he or she personally gained in fact a financial profit or other advantage to which he or she was not legally entitled. The benefits of this Paragraph A shall extend to the heirs and legal representatives of any person entitled to indemnification under this paragraph.

B. The Company may, to the extent authorized from time to time by the Board of Directors, or by a committee comprised of members of the Board or members of management as the Board may designate for such purpose, provide indemnification to employees or agents of the Company who are not officers or directors of the Company with such scope and effect as determined by the Board, or such committee.

C. The Company may indemnify any person to whom the Company is permitted by applicable law to provide indemnification or the advancement of expenses, whether pursuant to rights granted pursuant to, or provided by, the New York Business Corporation Law or other rights created by (i) a resolution of shareholders, (ii) a resolution of directors, or (iii) an agreement providing for such indemnification, it being expressly intended that these By-laws authorize the creation of other rights in any such manner. The right to be indemnified and to the reimbursement or advancement of expenses incurred in defending a proceeding in advance of its final disposition authorized by this Paragraph C shall not be exclusive of any other right which any person may have or hereafter acquire under any statute, provision of the Certificate of Incorporation, By-laws, agreement, vote of shareholders or disinterested directors or otherwise.

D. The right to indemnification conferred by Paragraph A shall, and any indemnification extended under Paragraph B or Paragraph C may, be retroactive to events occurring prior to the adoption of this Article XI, to the fullest extent permitted by applicable law.

E. This Article XI may be amended, modified or repealed either by action of the Board of Directors of the Company or by the vote of the shareholders.

ARTICLE XII

AMENDMENTS OF BY-LAWS

These By-laws may be altered, amended or repealed, at any time, in the manner provided in the Certificate of Incorporation of this Company.

ARTICLE XIII

EMERGENCY BY-LAW

A. This Emergency By-law shall become effective if the Defense

Council of New York, as constituted under the New York State Defense Emergency Act now in effect or as it may hereafter be amended from time to time, shall order the effectiveness of emergency By-laws of New York Corporations and shall cease to be effective when the Council shall so declare. This Emergency By-law may also become effective in the manner outlined in Section E of this Article.

B. In the event this Emergency By-law shall become effective, the business of the Company shall continue to be managed by those members of the Board of Directors in office at the time the emergency arises who are available to act during the emergency. If less than three such Directors are available to act, additional Directors, in whatever number is necessary to constitute a Board of three Directors, shall be selected automatically from the first available officers or employees in the order provided in the emergency succession list established by the Board of Directors and in effect at the time an emergency arises.

C. For the purposes of Sections B and D(3) of this Article, a Director shall be deemed unavailable to act if he shall fail to attend a Directors meeting called in the manner provided in Section D(1) of this Article. This section, however, shall not affect in any way the right of a Director in office at the time an emergency arises to continue as a Director.

D. The Board of Directors shall be governed by the following basic procedures and shall have the following specific powers in addition to all other powers which it would otherwise have.

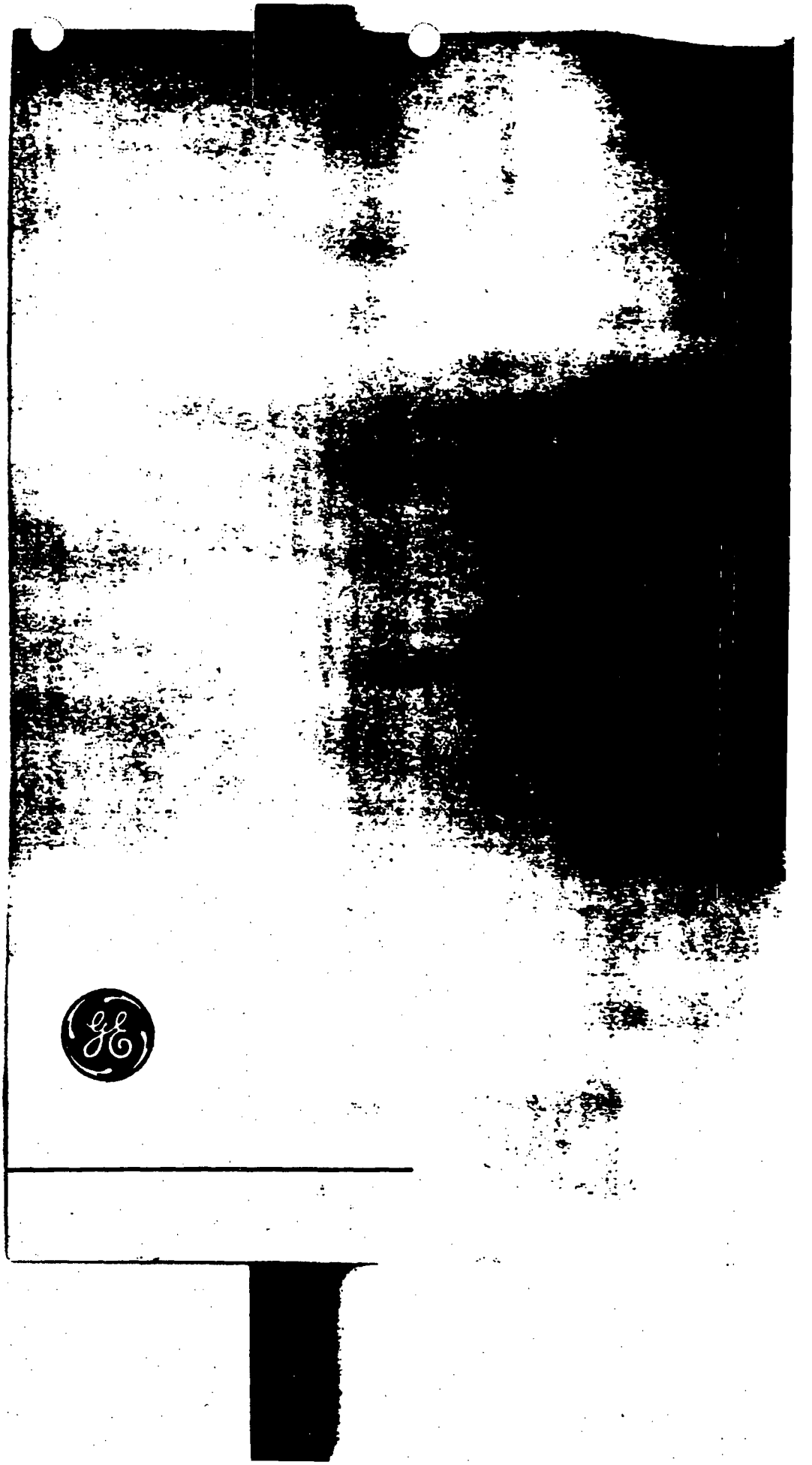
1. Meetings of the Board of Directors may be called by any Director, or by the first available officer or employee in the order provided in the emergency succession list referred to in Section B of this Article, by mailing to all Directors written notice thereof at their residence or place of business at least two days before the meeting and by using other reasonably available means of communication in an effort to contact each Director.
2. Three Directors shall constitute a quorum which may in all cases act by majority vote.
3. If the number of Directors who are available to act shall drop below three, additional Directors, in whatever number is necessary to constitute a Board of three Directors, shall be selected automatically from the first available officers or employees in the order provided in the emergency succession list referred to in Section B of this Article.
4. Additional Directors, beyond the minimum number of three Directors, but not more than three additional Directors, may be elected from any officers or employees on the emergency succession list referred to in Section B of this Article.
5. Any Director, other than a Director in office at the time an emergency arises, may be removed by a majority vote.
6. The Board of Directors may establish any additional procedures and may amend any of the provisions of this Article concerning the interim management of the affairs of the Com-

pany in an emergency if it considers it to be in the best interests of the Company to do so, except that it may not change Sections C or D(5) of this Article in any manner which excludes from participation any person who was a Director in office at the time an emergency arises.

7. To the extent that it considers it practical to do so, the Board of Directors shall manage the business of the Company during an emergency in a manner which is consistent with the Certificate of Incorporation and By-laws. It is recognized, however, that in an emergency it may not always be practical to act in this manner and this Emergency By-law is intended to and hereby empowers the Board of Directors with the maximum authority possible under the New York State Defense Emergency Act, and all other applicable law, to conduct the interim management of the affairs of the Company in an emergency in what it considers to be in the best interests of the Company.

E. If an obvious defense emergency exists because of an enemy attack and, if by reason of the emergency, the Defense Council of New York is itself unable to order the effectiveness of emergency by-laws as contemplated by Section A of this Article, then:

1. A quorum of the Board of Directors pursuant to Article II of these By-laws may order the effectiveness of this Emergency By-law or
2. If a quorum of the Board of Directors pursuant to Article II of these By-laws is not present at the first Board of Directors meeting called, in the manner provided in Section D(1) of this Article, after an emergency arises, then the provisions of this Emergency By-law shall automatically become effective and shall remain in effect until it is practical for a normally constituted Board of Directors to resume management of the business of the Company.



GE Nuclear Energy

Bertram Wolfe
Vice President and General Manager

General Electric Company
175 Curtner Avenue, San Jose, CA 95125
408 925-6900

CERTIFICATION OF FINANCIAL ASSURANCE

Principal: General Electric Company
175 Curtner Avenue
San Jose, CA 95125

Licenses and Facilities Covered by Certification of Financial Assurance

1. License No. SNM-960 — Amount: $750,000
   GE Nuclear Energy
   Vallecitos Nuclear Center
   Pleasanton, CA 94566

2. License No. 3400054-04 — Amount: $750,000
   GE Lighting
   1975 Noble Road
   Cleveland, Ohio 44112

3. License No. 3400054-05 — Amount: $750,000
   GE Lighting
   1975 Noble Road
   Cleveland, Ohio 44112

4. License No. SMB-191 — Amount: $750,000
   GE Lighting
   1975 Noble Road
   Cleveland, Ohio 44112

5. License No. STB-53 — Amount: $750,000
   GE Aircraft Engine
   1 Jimson Road
   Cincinnati, Ohio 45215

6. License No. SNM-1097 — Amount: $750,000
   GE Nuclear Energy
   Wilmington Nuclear Fuel
   & Component Manufacturing
   Castle Hayne Road
   Wilmington, North Carolina 28401

Issued to U.S. Nuclear Regulatory Commission

This is to certify that the General Electric Company is licensed to possess certain amounts of special nuclear material as specified in the above-listed NRC licenses, and that financial assurance in the amounts prescribed under the applicable parts of 10 CFR, Chapter I, totaling $4,500,000, has been obtained for the purpose of decommissioning the facilities subject to those materials licenses.

Vice President and General
Manager - GE Nuclear Energy

March 22, 1991

GE Nuclear Energy

March 21, 1991

Charles J. Haughney, Chief
Fuel Cycle Safety Branch
Office of Nuclear Material Safety & Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Haughney:

In accordance with Nuclear Regulatory Commission (NRC) technical and financial regulations for decommissioning licensed nuclear facilities published in 53FR24018; June 27, 1988, certification of financial assurance for $750,000 has been arranged for the Special Nuclear Materials License SNM-960. The license is held by the General Electric Company (GE) for the facilities located at Vallecitos Nuclear Center, P.O. Box 460, Pleasanton, CA 94566.

On August 20, 1990, General Electric (GE) submitted a Petition for Reconsideration to the Nuclear Regulatory Commission (NRC) requesting the NRC reconsider and reverse the denial of specific exemptions from the financial assurance mechanism requirements in 10 CFR Parts 50 and 70 by allowing GE to act as a self-guarantor to satisfy the requirements. GE also requested a time extension to the filing deadline until 15 days after GE is notified of the Commission's ruling on the Petition. This request for a time extension to the filing deadline was granted on August 27, 1990, in a letter to Dr. Bertram Wolfe from Mr. Robert M. Bernero. The decision denying GE's request for reconsideration was received by GE on March 11, 1991.

Financial Assurance for Decommissioning under 10 CFR Parts 30, 40, 50 and 70 in the amount of $35,600,000 has been arranged through an Irrevocable Standby Letter of Credit with Manufacturers Hanover Trust Company for the following NRC licenses held by the General Electric Company (GE).

Table 1

GE Nuclear Energy Licenses

Location	License No.	Type	Funding Requirement
Vallecitos Nuclear Center P.O. Box 460 Pleasanton, CA 94566	R-33	Part 50	Cost estimate based on PNL studies. $810,000
"	TR-1	Part 50	Cost estimate based on PNL studies. $12,816,000
"	DR-10	Part 50	Cost estimate based on PNL studies. $9,984,000
"	DPR-1	Part 50	Cost estimate based on PNL studies. $6,652,000
"	SNM-960	Part 70	Certification $750,000
Wilmington Nuclear Fuel Manufacturing P.O. Box 780 Wilmington, NC 28402	SNM-1097	Part 70	Certification $750,000
		TOTAL	$31,762,000

Table 2

Other GE Facilities

Location	License No.	Type	Funding Requirement
GE Lighting 1975 Noble Road Cleveland, OH 44112	3400054-04	Part 30	Certification $750,000
GE Lighting 1975 Noble Road Cleveland, OH 44112	3400054-05	Part 30	Certification $750,000
GE Lighting 1975 Noble Road Cleveland, OH 44112	SMB-191	Part 40	Certification $750,000
GE Aircraft Engine 1 Jimson Road Cincinnati, OH 45215	STB-53	Part 40	Certification $750,000
GE Aerospace 3198 Chestnut Street, 401 E. Hunting Pak Ave. Philadelphia, PA 230 Goddard Blvd. 970 Pulaski Road 720 Vandenburt Road King of Prussia, PA & at temporary job sites of the licenses anywhere in the U.S.	SUB-831	Part 40	Cost Estimate* $266,000
GE Aerospace 780 Third Avenue King of Prussia, PA	37-02006-09	Part 30	Cost Estimate* $267,000
General Electric Company Space Systems Division Valley Forge Space Center Valley Forge, PA	37-02006-05	Part 30	Cost Estimate* $267,000
		TOTAL	$3,800,000

*An estimated cost, $800,000 was provided for the three facilities.

If there are any questions regarding this submittal, please contact G. E. Cunningham on (415) 862-4330.

Very truly yours,

R. W. Darmitzel, Manager
Environmental Programs

/ca

STANDBY TRUST AGREEMENT

TRUST AGREEMENT, the Agreement entered into as of March 22, 1991 by and between GENERAL ELECTRIC COMPANY, a New York corporation, herein referred to as the "Grantor," and Manufacturers Hanover Trust Company, Corporate Trust & Agency Services, 450 West 33rd Street, New York, New York 10001 a New York State Chartered Bank, the "Trustee."

WHEREAS, the U.S. Nuclear Regulatory Commission (NRC), an agency of the U.S. Government, pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, has promulgated regulations in Title 10, chapter I of the Code of Federal Regulations, Parts 30, 40, 50, 70, and 72. These regulations, applicable to the Grantor, require that a holder of, or an applicant for the licenses shown in Schedule A to this Agreement provide assurance that funds will be available when needed for required decommissioning activities.

WHEREAS, the Grantor has posted a $35.6 million dollar standby Letter of Credit to provide all of such financial assurance for the facilities identified herein; and

WHEREAS, when payment is made under the standby Letter of Credit this standby trust shall be used for the receipt of such payment; and

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee is willing to act as trustee,

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

(a) The term "Grantor" means the NRC licensee who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term "Trustee" means the trustee who enters into this Agreement and any successor Trustee.

Section 2. Costs of Decommissioning. This Agreement pertains to the costs of decommissioning the materials and activities identified in the licenses issued by the NRC as shown in Schedule A to this Agreement.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a standby trust fund (the Fund) for the benefit of the NRC. The Grantor and the Trustee intend that no third party have access to the Fund except as provided herein.

Section 4. Payments Constituting the Fund. The Fund is established as initially unfunded and as consisting of a total of $-0-. Payments made to the Trustee for the Fund shall consist of payments made by the issuer of the Irrevocable Letter of Credit pursuant to its terms (which is acceptable to the Trustee and described in Schedule B). All property

and any other property subsequently transferred to the Trustee are referred to as the "Fund," together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount of, or adequacy of the Fund, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by the NRC.

Section 5. Payment for Required Activities Specified in the Plan. The Trustee shall make payments from the Fund to the Grantor upon presentation to the Trustee of the following:

a. A certificate duly executed by the Grantor attesting to the occurrence of the events, and in the form set forth in the attached Specimen Certificate, and

b. A certificate attesting to the following conditions;

(1) that decommissioning is proceeding pursuant to an NRC-approved plan.

(2) that the funds withdrawn will be expended for activities undertaken pursuant to that Plan, and

(3) that the NRC has been given 30 days' prior notice of General Electric's intent to withdraw funds from the escrow fund.

No withdrawal from the fund can exceed 100 percent of the outstanding balance of the Fund or $35.6 million dollars, whichever is greater, unless NRC approval is attached.

In the event of the Grantor's default or inability to direct decommissioning activities, the Trustee shall make payments from the Fund as the NRC shall direct, in writing, to provide for the payment of the costs of required activities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the NRC, or State agency, from the Fund for expenditures for required activities in such amounts as the NRC, or State agency, shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the NRC specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 6. Trust Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this section. In investing, reinvesting,

exchanging, selling, and managing the Fund, the Trustee shall discharge its duties with respect to the Fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(a) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended (15 U.S.C. 80a-2(a)), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;

(b) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal Government, and in obligations of the Federal Government such as GNMA, FNMA, and FHLM bonds and certificates or State and Municipal bonds rated BBB or higher by Standard and Poors or Baa or higher by Moody's Investment Services; and

(c) For a reasonable time, not to exceed 60 days, the Trustee is authorized to hold uninvested cash, awaiting investment or distribution, without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940 (15 U.S.C. 80a-1 et seq.), including one that may be created, managed, underwritten, or to which investment advice is rendered, or the shares of which are sold by the Trustee.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretion conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale, as necessary to allow duly authorized withdrawals at the joint request of the Grantor and the NRC or to reinvest in securities at the direction of the Grantor;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name, or in the name of a nominee, and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, to reinvest interest payments and funds from matured and redeemed instruments, to file proper forms concerning securities held in the Fund in a timely fashion with appropriate government agencies, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee or such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the U.S. Government, or any agency or instrumentality thereof with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. After payment has been made into this standby trust fund, the Trustee shall annually, at least 30 days before the anniversary date of receipt of payment into the standby trust fund, furnish to the Grantor and to the NRC a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days before the anniversary date of the establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the NRC, or State agency, shall constitute a conclusively binding assent by the Grantor, barring the grantor from asserting any claim or liability against the Trustee with respect to the matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting on the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing with the Grantor as shown in Schedule C to this Agreement.

Section 13. Successor Trustee. Upon 90 days notice to the NRC, the Trustee may resign; upon 90 days notice to the NRC and the Trustee, the Grantor may replace the Trustee; but such resignation or replacement shall not be effective until the Grantor has appointed a successor Trustee and this successor accepts the appointment. The successor Trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor Trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor Trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor Trustee or for instructions. The successor Trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the NRC or State agency, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are signatories to this agreement or such other designees as the Grantor may designate in writing. The Trustee shall be fully protected in acting without inquiry in accordance with the grantor's orders, requests, and instructions. If the NRC or State agency issues orders, requests, or instructions to the Trustee these shall be in writing, signed by the NRC, or State agency, or their designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor, the NRC, or State agency, hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instruction from the Grantor and/or the NRC, or State agency, except as provided for herein.

Section 15. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee and the NRC, or State agency, or by the Trustee and the NRC or State agency, if the Grantor ceases to exist.

Section 16. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 15, this trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the NRC or State agency, or by the Trustee and the NRC or State agency, if the Grantor ceases to exist. Upon termination of the trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor or its successor.

Section 17. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this trust, or in carrying out any directions by the Grantor, the NRC, or State agency, issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the trust fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 18. Applicable Law. This Agreement shall be administered, construed, and enforced according to the laws of the State of New York.

Section 19. Interpretation and Severability. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement. If any part of this agreement is invalid, it shall not affect the remaining provisions which will remain valid and enforceable.

Section 20. Notifications. All notices and communications hereunder shall be in writing and shall be deemed to be duly given if sent by registered mail, return receipt requested, as follows:

Manufacturers Hanover Trust Company
Corporate Trust & Agency Services
450 West 33rd Street
New York, NY 10001
Attention: Escrow Administration, 15th Floor

General Electric Company
175 Curtner Avenue
San Jose, California 95125
Attention: Manager Government Finance

U.S. Nuclear Regulatory Commission
Washington, DC 20555
Attention: Decommissioning Funding

or at such other address as any of the above may have furnished to the other parties in writing by registered mail, return receipt requested and any such notice or communication given in the manner specified in

this Section 20 shall be deemed to have been given as of the date so mailed except with respect to the Trustee as to which data shall be deemed to have been given on the date received by the Trustee.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by the respective officers duly authorized and the incorporate seals to be hereunto affixed and attested as of the date first written above.

ATTEST: GENERAL ELECTRIC COMPANY

Dr. B. Wolfe
Vice President and General Manager
[Title]
[Seal]

Manufacturers Hanover Trust Company
[Signature of representative of Trustee]
[Title]
J.M. Scimechitano
Vice President

ATTEST:
[Title]
[Seal]
TRUST OFFICER

this Section 20 shall be deemed to have been given as of the date so mailed except with respect to the Trustee as to which data shall be deemed to have been given on the date received by the Trustee.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by the respective officers duly authorized and the incorporate seals to be hereunto affixed and attested as of the date first written above.

ATTEST:

GENERAL ELECTRIC COMPANY

B. Wolfe

Dr. B. Wolfe
Vice President and General
Manager
[Title]
[Seal]

Manufacturers Hanover Trust Company
[Signature of representative
of Trustee]
[Title]

ATTEST:
[Title]
[Seal]

GENERAL ELECTRIC COMPANY
TRUST AGREEMENT SCHEDULE

($ IN THOUSANDS)

U.S. NUCLEAR REGULATORY COMMISSION LICENSE NUMBER	NAME AND ADDRESS OF LICENSEE	ADDRESS OF LICENSED ACTIVITY	COST ESTIMATES FOR REGULATORY ASSURANCE DEMONSTRATED BY THIS AGREEMENT
DPR-1	GENERAL ELECTRIC CO; GE NUCLEAR ENERGY; 175 CURTNER AVENUE; SAN JOSE, CALIFORNIA 95125	GE NUCLEAR ENERGY; VALLECITOS NUCLEAR CENTER; 6705 VALLECITOS ROAD PLEASANTON, CALIFORNIA 94566	$ 6 672
R-33	" "	" "	810
TR-1	" "	" "	12 816
DR-10	" "	" "	9 984
SNM-960	" "	" "	750
SNM-1097	" "	GE NUCLEAR ENERGY CASTLE HAYNE ROAD WILMINGTON, NORTH CAROLINA 28401	750
3400054-04	GE LIGHTING 1975 NOBLE ROAD CLEVELAND, OH 44112	GE LIGHTING 1975 NOBLE ROAD CLEVELAND, OH 44112	750
3400054-05	" "	" "	750
SMB-191	" "	" "	750
STB-53	GE AIRCRAFT ENGINE 1 JIMSON ROAD CINCINNATI, OH 45215	GE AIRCRAFT ENGINE 1 JIMSON ROAD CINCINNATI, OH 45215	750

GENERAL ELECTRIC COMPANY
TRUST AGREEMENT SCHEDULE

($ IN THOUSANDS)

U.S. NUCLEAR REGULATORY COMMISSION LICENSE NUMBER	NAME AND ADDRESS OF LICENSEE	ADDRESS OF LICENSED ACTIVITY	COST ESTIMATES FOR REGULATORY ASSURANCE DEMONSTRATED BY THIS AGREEMENT
SUB-831	GENERAL ELECTRIC GE AEROSPACE P.O. BOX 8553 PHILADELPHIA, PA 19101	GE AEROSPACE 3198 CHESTNUT STREET 401 E. HUNTING PARK AVE. PHILADELPHIA, PA 130 GODDARD BLVD, 970 PULASKI ROAD, 780 VANDENBURT ROAD, KING OF PRUSSIA, PA & AT TEMPORARY JOB SITES OF THE LICENSES ANYWHERE IN THE US	266
37-02006-09	GE AEROSPACE P.O. BOX 8555 PHILADELPHIA, PA 19101	GE AEROSPACE 780 THIRD AVENUE KING OF PRUSSIA, PA	267
37-02006-05	SPACE SYSTEMS DIVISION P.O. BOX 8555 PHILADELPHIA, PA 19101	GE SPACE SYSTEMS DIVISION VALLEY FORGE SPACE CENTER VALLEY FORGE, PA	267
TOTAL			$35 582

GENERAL ELECTRIC COMPANY
DECOMMISSIONING FUNDING PLAN

STANDBY LETTER OF CREDIT IN THE AMOUNT OF $35,600,000

MANUFACTURERS HANOVER TRUST COMPANY
CORPORATE TRUST & AGENCY SERVICES
450 WEST 33RD STREET
NEW YORK, NEW YORK 10001

SCHEDULE B

GENERAL ELECTRIC COMPANY

FIVE THOUSAND DOLLARS ($5,000) PER ANNUM OR ANY PART THEREOF WITHOUT PRORATION FOR PARTIAL YEARS. EFFECTIVE AND PAYABLE UPON THE ESTABLISHING OF THE STANDBY TRUST FUND WITH AN ADDITIONAL $5,000 PER ANNUM OR ANY PART THEREOF WITHOUT PRORATION PAYABLE UPON THE FIRST PAYMENT FOR THE FUND.

SCHEDULE C

Specimen Certificate of Events
Manufacturers Hanover Trust Company
Corporate Trust & Agency Services
450 West 33rd Street
New York, New York 10001

Attention: Escrow Administration
Gentlemen:

In accordance with the terms of the Agreement with you dated March 22, 1991, I, _____, General Manager of [insert name of licensee], hereby certify that the following events have occurred:

1. General Electric Company is required to commence the decommissioning of its facility located at [insert location of facility] (hereinafter called the decommissioning).

2. The plans and procedures for the commencement and conduct of the decommissioning have been approved by the United States Nuclear Regulatory Commission, or its successor, on _____ (copy of approval attached).

3. The Board of Directors of General Electric Company has adopted the attached resolution authorizing the commencement of the decommissioning.

_____

General Manager, GE _____

_____
Date

_____
Attesting Secretary - General Electric Company
[SEAL]

Certificate of Resolution

I, _____, do hereby certify that I am an Attesting Secretary of General Electric Company, a New York Corporation, and that the resolution listed below was duly adopted at a meeting of this Corporation's Board of Directors on _____, 19__.

IN WITNESS WHEREOF, I have hereunto signed my name and affixed the seal of this Corporation this _____ day of _____, 19__.

_____
Secretary

RESOLVED, that this Board of Directors hereby authorizes the President, or such other employee of the Company as he may designate, to commence decommissioning activities at [insert name of facility] in accordance with the terms and conditions described to this Board of Directors at this meeting and with such other terms and conditions as the President shall approve with and upon the advice of Counsel.

040-07344

GE Aerospace

Aerospace Operations Division
General Electric Company
Curtis Center, Suite 625, 6th and Walnut Streets
Philadelphia, PA 19106
215 238-

July 27, 1990

NRC Region DNE
475 Allendale Road
King of Prussia, PA 19406

RECEIVED AUG -6 '90 3:45

Re: License # SUB831
License # 37-02006-05

Transmitted herewith is "Cost Estimates for General Electric Aerospace Decommissioning Funding Plan". GE hereby requests a 30-day extension while we pursue submitting a performance bond in support thereof. Please also be aware that we are petitioning the Commission to waive the requirement for a third-party financial expenditure.

Very truly yours,

Melvin B. Schweiger

Melvin B. Schweiger
Manager-Quality and
Environmental Programs
(215) 238-8365

/mm

Enclosure

'90 JUL 30 P1:03

RECEIVED-REGION I

Log Aug-13 I
Remitter
Check No. Check When Issued
Amount
Fee Category 2C
Type of Fee amd
Date Check Rec'd.
Date Completed 10/29/90
By: SK

113058

OFFICIAL RECORD COPY ML10

JUL 27 1990

PHONE, 215-896-5353

PORTER CONSULTANTS, Inc.

Radiological Protection and Environmental Services

125 ARGYLE ROAD
ARDMORE, PA. 19003

PCI-TR-332

Cost Estimates for General Electric Aerospace Decommissioning Funding Plan

Prepared:

July 13, 1990

Prepared by:

John Sykes III
Consultant Health Physicist

Reviewed by:

Sydney W. Porter, Jr.
Certified Health Physicist
President

Porter Consultants, Inc.
125 ARGYLE ROAD
ARDMORE, PA. 19003
215-896-8353

PCI-TR-332

1.0 EXECUTIVE SUMMARY

1.1 In June, 1988, the US Nuclear Regulatory Commission (NRC) published regulations [Ref. 4.3] which will require all licensees and applicants for licenses to provide funds for the eventual decommissioning of sites at which radioactive materials are or would be used. The requirements were limited to licensees who possessed radioactive material in excess of certain amounts listed in specified sections of the NRC regulations [Ref. 4.1]. At lower levels of possession, licensees are only required to post bonds or similar forms of financial assurance, in specified amounts, for the eventual decommissioning of the site. In the case of larger licensees (such as GE Aerospace), it is necessary to prepare a plan to detail the cost of decommissioning the facility as well as to describe the financial instruments to be used to fund the decommissioning. These plans and the attendant financial assurance mechanisms were required to be in place by July 28, 1990. This report was commissioned to determine the financial assurance required to be posted by GE Aerospace under these regulations.

1.2 As we proceeded into this project it became apparent that, in the case of GE Aerospace, the major problem is not the decontamination and decommissioning of facilities (e.g., contaminated laboratories, manufacturing facilities, etc.), but rather the disposal of (primarily) sealed sources of radioactive material. This can present a problem since the limits for disposal of radioactive material are not based on the absolute quantity of radioactive material to be disposed of, but rather on the concentration of the radioactive material (either by volume or by weight) in the waste. However, in most cases it should be possible to dispose of higher activity sources in a drum packed with many of the low-level items, such as the low-level contaminated/activated printed circuit boards.

1.3 Based on the available information, the comprehensive cost estimate for the decommissioning of both the Philadelphia and Valley Forge facilities is about $500,000 (see Attachment 5.1). This estimate has been corrected for inflation, in that the disposal costs are based on the 1996 anticipated cost for the Pennsylvania Low Level Radioactive Waste Repository. However, it should be noted that since the cost for radioactive waste contractors and disposal costs have significantly exceeded the national inflation rate, projections of this nature are difficult at best. Therefore, these estimates will be revised as necessary, and sufficient financial assurance maintained for any contingencies.

2.0 TECHNICAL DISCUSSION

2.1 DESCRIPTION OF FACILITIES

Although the overall GE Aerospace facilities are quite extensive, the specific locations where radioactive material is stored or used are limited to a few areas at each of the two GE Aerospace facilities.

2.1.1 PHILADELPHIA FACILITY

At the Philadelphia facility, most of the radioactive material is presently stored in a single vault. Only 5 or 6 sealed sources are used or stored in other locations (Rooms 5177, 1647 and T-110). There is currently no use of unsealed radioactive sources at the Philadelphia facility. Therefore, the decontamination effort would be limited to a thorough survey (with wipe tests, etc.) of the storage vault. However, we have included an estimate for decontaminating the exhaust ventilation system of the vault,

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in the remote case that it is found to be contaminated (this cost may be eliminated when a comprehensive survey is accomplished after the radioactive material contained in the vault is removed).

NOTE: The disposal of items stored in the Philadelphia facility vault are not included in the current price estimates as the subject material is already scheduled for disposal (after certain items are declassified) and the disposal cost has already been funded ($91,000).

2.1.2 VALLEY FORGE FACILITY - Storage Locations

The location of radioactive material at the Valley Forge facility is more extensive. There are four storage locations for radioactive material. They are:

2.1.3.1 Kr-85 gas storage vault outside of Building 100.

2.1.3.2 IS&H radioactive materials storage vault in Building 100 (inventory enclosed as Attachment 5.3).

2.1.3.3 Satellite storage location in Building B.

2.1.3.4 Magnesium-Thorium alloy plate storage in Building 21.

The above facilities are used for storage only, radioactive material is not utilized at these locations.

2.1.3 VALLEY FORGE FACILITY - Locations of Use (and storage).

2.1.3.1 IS&H laboratory: calibration of instruments utilizing sealed sources (largest source - 100 mCi Cs-137).

2.1.3.2 Plating, Building 100, Room M-4239: plating thickness gauges - sealed beta sources (μCi amounts).

2.1.3.3 Building 100, Tunnel Level, Room T-9878: experimental density gauges - sealed Co-60 sources (80, 100 & 150 mCi).

2.1.3.4 Building 100, Room U-8618: storage? thorium oxide, uranyl nitrate, uranyl acetate - closed area could not inspect.

2.1.3.5 Building 100, Room U-8604: worked with unsealed sources in past, room needs survey and, maybe, decontamination - closed area, could not inspect.

2.1.3.6 Building 100, Room U-8614: same as above, room needs survey and, maybe, decontamination - closed area, could not inspect.

2.1.3.7 Building 8, Room C-8340: stored irradiated components in cabinet, both Gammacell 220s located here (b)(4) otal sealed Co-60 sources. Ex 4

2.1.3.8 Building 100, U-8301: Kr-85 leak detector (0.5 Ci), in storage only, should be decommissioned.

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2.1.3.9 Additionally, a few Ni-63 plated sources are used in gas chromatographs at the Valley Forge facility.

2.2 FACILITY DECOMMISSIONING EFFORT REQUIRED

2.2.1 As stated above, it is expected that the decommissioning effort for the Philadelphia facility will be limited to preparing and shipping sources for disposal. As a precaution, we recommend a thorough survey be performed of the storage vault after the sources are removed. The cost of decontaminating and disposing of components of the vault exhaust ventilation system have been included in this estimate as a precaution. This line item will be re-evaluated upon completion of the disposal project.

2.2.2 At the Valley Forge facility, decommissioning would be restricted to the RESD laboratories, where radioactive material (thoriated alloys) is machined. We have included cost estimates to decontaminate/decommission laboratories located in Rooms U-8604 & 8614. These estimates are based on the cost estimates contained in NUREG/CR-1754 [Ref. 4.7] for similar facilities, which we believe to be conservative for the subject labs. It is important to note that both laboratories have recently been surveyed and radiation/contamination levels were found to be below the levels for unrestricted use. However, the labs may be used in the future for machining of radioactive material, and are, therefore, funded for decontamination/decommissioning.

2.2.3 The major problem at Valley Forge is <u>not</u> the decommissioning of facilities, but the disposal of radioactive sources. As some of the source activities are quite high, their disposal may require careful planning. The major problems would appear to be: the Am-241 sources, the two Co-60 irradiators (Gammacell 220s), the Pu-238 & Pu-239 sources, the Kr-85 gas and the satellite mid-body (due to its volume). A letter of agreement has been received which would allow GE to return the Co-60 to the vendor (Attachment 5.2), the Kr-85 and satellite mid-body would be returned to the USAF (who owns these items), and many of the other smaller (millicurie) sources could be combined with Low-Specific-Activity (LSA) waste to stay below Class A limits. The "problem sources" are discussed further in Section 2.3, below.

2.3 DISPOSAL OF SOURCES

2.3.1 As stated above, some of the larger sources (and sources of transuranic elements) present a special problem for disposal. The main criteria for disposal, in the proposed Pennsylvania regulations [Ref. 4.2], is the specific activity (concentration) and half-life of the sources. As the half-life decreases, additionally concentrated activity is permitted at the disposal sites. On the other hand, for long half-life transuranics or source material, only very small concentrations are permitted. Also, there are specific prohibitions for liquid and gaseous materials (liquids must be solidified and gases can only be shipped in DOT containers at no more than 1.5 atmospheres pressure). Therefore, the following solutions are proposed:

2.3.1.1 GAMMACELL 220 IRRADIATORS Ex 4

The two irradiators contain (b)(4) and (b)(4) (nominal) of Co-60, in Certified Special Form. NORDION (formerly AECL) has agreed to remove the sources from the GE facility for $18,600.00 (see Attachment

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5.2). This quotation has been adjusted for future inflation (10% per year for 5 years) in the current cost estimate ($27,900).

2.3.1.2 Kr-85 GAS

The Kr-85 gas is currently located mainly in 12 gas cylinders. Due to the restrictions on disposal, the gas will be returned to the contracting agency (USAF), or be disposed of at the agency's expense.

2.3.1.3 1 Ci & 12 mCi Am-241 SOURCES

These sources will have to be disposed of as Class C radioactive material (long half-life). The larger source will need to be placed in a mass weighing at least 22,000 lbs. to be below the 100 nCi/g limit. We estimate the final volume to be approximately 216 ft^3 at a cost of approximately $80,000.00. The smaller source can probably be disposed of in a 55 gal. drum, filled with concrete at a cost of approximately $7,500.00..

2.3.1.4 100 mCi Cs-137 IRRADIATOR

This source could be disposed of as-is if the shield qualifies as a Type B overpack. If not, a Type B would have to be factored into the cost. There are no major restrictions on disposal of Cs-137 (except for concentration limits).

2.3.1.5 Pu-238 & Pu-239 SOURCES

These sources are special nuclear material and therefore a limit of 100 nCi/g applies. The sources could be placed in individual 55 gal drums and the drums filled with concrete (approximately 1,000 lbs). This would keep the concentration below 100 nCi/g. A Type B overpack would be required for shipment. Disposal costs for the Pu-238 sources is estimated to be $20,000.00 in 1996 dollars. As the source activities of the Pu-239 sources are relatively low (μCi amounts) they can most likely be disposed of as Class A, in standard 55 gal. drums.

2.3.1.6 Numerous printed circuit boards have been neutron activated. Since many of these activities took place many years ago, probably many of these have decayed to below limits for release for unrestricted use. We presently do not have even an estimate of either the radioisotope or the amount involved. We assume that all of these materials will fit into twenty 55 gallon drums, and are Class A (LSA) levels.

2.3.1.7 Finally, the last major problem is the satellite mid-body stored at Valley Forge. This item is in a 12' × 12' × 12' storage box. Disposal of the items as is could cost as much as $345,000.00, unless the volume is reduced. However, as this satellite belongs to the Defense Nuclear Agensy (DNA), disposal would be their responsibility.

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2.5 SOURCE OF COST ESTIMATES

2.5.1 Cost estimates for decommissioning facilities were developed using the guidelines of NUREG/CR-1754. Based on the survey data for the GE labs and the nature of their previous and planned use, it is believed that the cost estimates in the subject guide are extremely conservative. These labs are used primarily for machining magnesium-thorium alloy metals, and, therefore, the contamination generated is of large particle size, insoluble and relatively inert. Secondly, even in its pure form, the specific activity of the alloys are low, and any contamination generated would also be low (unlike the several orders of magnitude reductions required in the test labs upon which the NUREG is based). Decontamination efforts for these labs would primarily be limited to vacuuming and wiping surfaces, and removal and disposal of hood, glovebox and other ventilation system filters.

2.5.2 Costs for preparing sources for shipment, shipping expenses, etc. have been factored into the cost estimates by doubling the burial costs. The burial costs were provided by Mr. William Dornsife, who is the chief technical expert for the Appalachian Compact at PA DER. The basic burial cost of $100/ft^3 for Class A waste, $250/ft^3 for Class B waste and $500/ft^3 for Class C waste was doubled for the current estimate. The practice of doubling the burial cost to estimate the total disposal cost including packing, shipping, etc. is common practice in the radioactive waste business (for LLRW). Since the repository would be located in PA, the shipping costs will be considerably less than current costs. Therefore, the estimates should be very conservative. Additional labor to analyze the unknown sources, prepare the proper documentation, and perform necessary surveys, has been estimated to be equal to the effort proposed for the Philadelphia facility, has been adjusted for inflation and included as a separate line item.

2.5.3 Estimated costs for disposal of certain high-level sources (e.g., Am-241 and Pu) were obtained from representatives of US Ecology, the operators of the Hanford, WA and Beatty, NV repositories, based on previous experience. In most cases, these estimated prices include encapsulating the sources in sufficient material (concrete) to meet the specific activity limits for special nuclear material and transuranics. Some of the low-activity Pu calibration sources may be disposed of as LSA waste depending on the concentration limits.

2.5.4 Kr-85 gas could present a special disposal problem. However, as the possession of this gas is a requirement to fulfill a USAF contract, GE is pursuing the disposition of these sources through government channels.

2.5.5 NORDION (formerly AECL) has provided a quotation and is willing to remove the two high-activity Co-60 sources located in the Gammacell 220 irradiators. Their quote has been adjusted for inflation in this report (a conservative 10% per year inflation rate was assumed).

2.5.6 Finally, a satellite "mid-body" is located at the Valley Forge facility. The satellite was contaminated/activated in experiments and may have to be disposed of. This satellite is the property of DNA, however, and therefore the federal government would be responsible for its disposal. Based on the volume of this satellite, these disposal costs could run over $300,000 (or with volume reduction $100,000). This amount would have to be provided by DNA, and is not funded by GE.

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4.0 REFERENCES

4.1 Code of Federal Regulations, Title 10. *Energy*. Current edition. US Government Printing Office. Washington, DC.

4.2 Commonwealth of Pennsylvania, Environmental Quality Board. Proposed Rulemaking: Low-Level Radioactive Waste Management and Disposal. 25 PA Code Ch 236. Pennsylvania Bulletin, 18[29]:3167-3195; July 16, 1988.

4.3 *General Requirements for Decommissioning Nuclear Facilities.* 53 FR 123. 24018—24056. Available from: US Government Printing Office. Washington, DC; 1988.

4.4 *Standard Format and Content of Decommissioning Plans for Licensees under 10 CFR Parts 30, 40 and 70.* Regulatory Guide 3.65. US NRC. Washington, DC; 1989.

4.5 *Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning under 10 CFR Parts 30, 40, 70 and 72.* Draft Regulatory Guide DG-3002. US NRC. Washington, DC; 1990.

4.6 *Standard Review Plan for the Review of Financial Assurance Mechanisms for Decommissioning Under 10 CFR Parts 30, 40, 70 and 72.* NUREG-1337, Rev. 1. US NRC. Washington, DC; 1989.

4.7 *Technology, Safety and Costs of Decommissioning Reference Non-Fuel-Cycle Nuclear Facilities.* NUREG/CR-1754. US NRC. Washington, DC; 1981.

5.0 ATTACHMENTS

5.1 Decommissioning Funding Plan Cost Estimate Spreadsheet

5.2 Quotation from NORDION for removal of Gammacell 220 Irradiators

5.3 Inventory of Valley Forge Facility Radioactive Materials Storage Vault and Industrial Health & Safety Laboratory (supplied by GE)

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Attachment 5.1

Activity	Isotope	Half-Life	Large Sources (description)	Waste Class			Estimated Cost
1 Ci	Am-241	432 y	Need more information on this source	Class C	Special disposal (see text)	=	$60,000.00
12 mCi	Am-241	432 y	Need more information on this source	Class C	Special disposal (see text)	=	$7,500.00
10 mCi	Cd-109	464 d	Current activity approx. 10 mCi	Class A	Can be placed with other Low-Level waste		
311 mCi	Co-57	271 d	Need assay date (may have decayed away)	Class A	May now be Low-Level		
10 mCi	Co-57	271 d	Need assay date (may have decayed away)	Class A	May now be Low-Level		
3 mCi	Co-57	271 d	Less than 100 mCi as of 1990	Class A	Can be placed with Low-Level waste		
[redacted]	Co-60	5.27 y	AECL (MODEL108) Gammacell 220 Irradiator	Class B	Return to vendor	=	$27,000.00
	Co-60	5.27 y	AECL (MODEL108) Gammacell 220 Irradiator				
80, 100 R							
150 mCi	Co-60	5.27 y	"Experimental Density Gauge"	Class A	Estimated $200/ft^3 (1 drum)	=	$1,500.00
111 mCi	Co-60	5.27 y	Current activity approx. 7 mCi	Class A			
10 mCi	Co-60	5.27 y	Current activity approx. 625 mCi	Class A			
10 mCi	Co-60	5.27 y	Current activity approx. 625 mCi	Class A			
10 mCi	Co-60	5.27 y	Current activity approx. 625 mCi	Class A	Combine several sources into		
10 mCi	Co-60	5.27 y	Current activity approx. 625 mCi	Class A	1 drum @ $1,500.00/drum	=	$1,500.00
10 mCi	Co-60	5.27 y	Current activity approx. 5 mCi	Class A			
7 mCi	Co-60	5.27 y	Need assay date	Class A			
1 mCi	Co-60	5.27 y	Current activity approx. 63 mCi	Class A			
100 mCi	Cs-137	30.2 y	Irradiator/Calibrator	Class A	Estimated $200/ft^3 (1 drum)	=	$1,500.00
39 mCi	Cs-137	30.2 y	Source in lead pig	Class A			
10 mCi	Cs-137	30.2 y	Source in lead pig	Class A			
1 mCi	Cs-137	30.2 y	Source in lead pig	Class A	Combine several sources into		
200 mCi	Gd-153	242 d	Current activity approx. 8 mCi	Class A	1 drum @ $1,500.00/drum	=	$1,500.00
200 mCi	H-3	12.3 y	3x Static Meters	Class A			
100 mCi	H-3	12.3 y	3x Static Meters	Class A			
100 mCi	H-3	12.3 y	3x Static Meters	Class A			
100 mCi	Ir-192	74 d	Source should be decayed to background by now	N/A			
36 Ci	Kr-85	10.7 y	High-Pressure gas cylinders	Class A	See text (disposal by USAFP)		
300 mCi	Kr-85	10.7 y	Need to know form, etc.	Class A	Special disposal		
100 mCi	Kr-85	10.7 y	Need to know form, etc.	Class A	Special disposal		
12 mCi	Kr-85	10.7 y	Need to know form, etc.	Class A	Special disposal		
4.9 mCi	Kr-85	10.7 y	Gas in 250 psi cylinder	Class A	Special disposal		
2 mCi	Kr-85	10.7 y	Need to know form, etc.	Class A	Special disposal		
8 mCi	Mn-54	313 d	Need assay date	Class A			
135 R							
15 mCi	Ni-63	100 y	Gas Chromatograph source?	Class A			
8 mCi	Ni-63	100 y	Gas Chromatograph source?	Class A	Combine several sources into		
50 mCi	Pm-147	2.62 y	Need assay date	Class A	1 drum @ $1,500.00/drum	=	$1,500.00
50 mCi	Pm-147	2.62 y	Need assay date	Class A			
30 mCi	Pu-238	87.8 y	3 sources (Calibrator?)	Class C	Special disposal (see text)	=	$15,000.00
10 mCi	Pu-238	87.8 y	Source in collar (need more information)	Class C	Special disposal (see text)	=	$5,000.00
33 pCi	Pu-238	87.8 y		Class A	See text		
6 mCi	Pu-239	24100 y	Need source activities	Class A			
5 mCi	Pu-239	24100 y	Need source activities	Class A	Small activity Pu-239 sources should be		
4 mCi	Pu-239	24100 y	Need source activities	Class A	disposable as Class A waste rather than Class C		
825 pCi	Pu-239	24100 y		Class A			
4891 mCi	Se-75	120 d	If info. correct, source should be decayed to background	N/A			
152 mCi	Se-75	120 d	If info. correct, source should be decayed to background	N/A			
10 Ci	Sr-90	28.6 y	Beta Calibrator	Class B	Estimated $500/ft^3 (1 drum)	=	$3,500.00
100 mCi	Sr-90	28.6 y	Beta Calibrator	Class A	Combine both sources into		
10 mCi	Sr-90	28.6 y	Beta Calibrator	Class A	1 drum @ $1,500.00/drum	=	$1,500.00
15 mCi	Ta-182	115 d	If info. correct, source should be decayed to background	N/A			
5 mCi	Ta-182	115 d	If info. correct, source should be decayed to background	N/A			

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5 mCi	Cs-102	115 d	Need assay date (may have decayed away)	N/A		
20 kg	Th-232	1.41E+10 y	Mg-Th Alloy plates (12 plates, apprx. 300 lbs ea. @ 4% Th)	Class C	Estimated $1000/ft^3 (12 drums)	= $90,000.00
10 kg	Th-232	1.41E+10 y	Total for all other thorium sources (approx.)	Class C	Estimated $1000/ft^3 (1 drum)	= $7,500.00
100 mCi	Tl-204	3.78 y		Class A	Combine with LLRW	
50 mCi	Tl-204	3.78 y		Class A	Combine with LLRW	
< 1000 mg	U-235	7.04E+08 y	Fissionable material may be returnable to DOE	N/A		
< 2 kg	U-238	4.47E+09 y	Total U-238 on hand (mostly natural uranium in chemicals)	Class C	Estimated $1000/ft^3 (2 ft^3)	= $2,000.00
Unknown	Mixed FP/AP		Satellite "Mid-Body" (12' x 12' x 12" container)	Class A	See text (property DOE)	
				Total estimated price for all sources (rounded up)		= $250,000.00

Disposal of all sub-millicurie sources at Valley Forge facility. Includes contaminated/activated PC boards, etc. Estimated $200/ft^3 (15 - 20 drums) = $30,000.00

Building	Room	Facilities which may require decontamination/decommissioning*		
VF Bldg. 100	U0604	Lab: 2 hoods & glove box, HEPA filters, etc.	Latest survey shows < unrestricted limits	= $35,000.00
VF Bldg. 100	U0614	Lab: Hood, glove box, storage cabinets, HEPA filters, etc.	Latest survey shows < unrestricted limits	= $27,000.00
Philadelphia	Vault	HVAC system (disassemble & decon or dispose)	Should not be contaminated (survey first)	= $9,000.00
VF Bldg. 100	Vault	Analyze & remove LLRW & excess sources at VF for disposal**	Price based on contract for ZS Vault	= $125,000.00
			Total estimated price for decom/decon	= $196,000.00
			Total estimated price for all work***	= $476,000.00

* Cost estimates based on worst-case situation (labs currently are "clean"). Prices are based on NUREG/CR-1754 estimates and are considered to be conservative.
** $91,000 contract has already been awarded for similar work at Re-Entry Systems (Philadelphia) facility.
*** Cost estimates based on assumptions contained in text of report. Does not include sources otherwise noted or sources not inventoried.

JUL 25 '90 15:53 GE*VALLEY FORGE MMW PROJECTS

QUOTATION

PRO-FORMA INVOICE

FROM: **NORDION INTERNATIONAL INC.**

TO: Mr. Don Cheater, Safety Officer
General Electric Co.
Astro Space Division
P.O. Box 8555, Philadelphia, PA
U.S.A. 19101
(215) 354-3917

DATE: 1990 June 11

OUR REFERENCE: 90-IPQ-288

YOUR REFERENCE:

ITEM	DESCRIPTION	AMOUNT
	Disposal of Gammacell 220 #157 and 186R	
1.	OPTION 1	
	Service work provided by one Nordion technician to pack and crate Gammacell-220, #157, for removal and disposal.	$13,915.00
	OPTION 2	
	Service work provided by one Nordion technician to pack and crate Gammacell-220, #186R, for removal and disposal.	$11,560.00
	OPTION 3	
	Service work provided by one Nordion technician to pack and crate Gammacell-220 units, #157 and #186R.	$18,585.00
2.	Provision of packing and crating material required to put unit into shipping mode.	Included
3.	Shipping charges to be arranged for and paid for by Nordion.	Included
4.	Disposal of Cobalt-60.	Included
5.	NOTES: a) Customer is responsible for rigging. b) Customer must supply service of one technician to assist the Nordion technician.	
	UNLESS OTHERWISE STATED, PRICES DO NOT INCLUDE ANY TAXES OR DUTY — TOTAL	As selected

SHIPPING SCHEDULE:

To be determined as mutually agreed

TERMS: Net 30 days

DELIVERY POINT: F.O.B. Destination

CURRENCY: UNITED STATES

QUOTATION VALID UNTIL: 1990 August 31

NORDION INTERNATIONAL INC.
447 March Road, P.O. Box 13500, Kanata, Ontario Canada, K2K 1X8
447 Chemin March, C.P. 13500, Kanata, Ontario, Canada, K2K 1X8

ISSUED ON BEHALF OF NORDION: Terry Kehoe

THIS QUOTATION IS SUBJECT TO TERMS ON FACE AND REVERSE HEREOF.

OU-43-2

#	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
VF001	CO60 PIG 10MC (SOURCE)	5X5X6	0.090	15000	4.00	Co60	Nuclear Product-3m, St Paul,MN	PO 037 - t03, 04-N 10/2/86
VF002	MAILING CONTANER O-D CAN	7.5X7.5X9	0.300	50	0.05		Giannini Controls Corp	Reusable Container Empty
VF003	SR 90 SOURCE 100 MC	3.5X3.5X5	0.030	2500	0.80	Sr 90	3M, St. Paul, MN	lead pig 6/11/78
VF004	CS137	SOURCE 10MC	0.020	80000	11.00	CS137	3M, St. Paul, MN	lead pig 9/3/68
VF005	SE75 152 MC	2.5 X 2.5 X 3.5	0.010	250	0.03	Se75	Radiation Materials Corp, MA	lead pig 10/70
VF006	CO57 SOURCE 311 MC	2.5 X 2.5 X 3.5	0.010	11000	0.03	CO57		lead pig 3/21/74
VF007	SR 90 SOURCE 10 MC	2.5 X 2.5 X 3.5	0.010	11000	1.70	SR 90	3M, St. Paul, MN	lead pig 9/23/68
VF008	KR 85 100 MC	2.5 X 2.5 X 3.5	0.010	12000	1.30	KR 85	3M, St. Paul, MN	lead pig 12/68
VF010	CO 57 3MC	2.5 X 2.5 X 3.0	0.010	80	0.04	CO 57	New England Nuclear	pig 8/7/76
VF011	BA113	4 X 4 X 6.5	0.060	100	0.04	BA 113	New England Nuclear	pig
VF012	GD 153 200 MC	2 X 2 X 4.5	0.010	150	0.04	GD 53		lead pig 12/1/73
VF013	TR 192 100 MC	2 X 2 X 4	0.010	110	0.07	TR 192		lead pig A-71
VF014	CD 109 10 MC	3 X 3 X 6	0.030	150	0.05	CD 109	Radiation Materials Corp., MA	pig inside board container 7/31/70
VF009	CD 137 1.0 MC	4 X 4 X 7	0.060	10000	1.60	cs 137	Applied Physics Inc.	lead pig 12/68
VF015	CO 60 111 MCI	1.5 X 1.5 X 3.5	0.004	15000	1.90	CO 60	Radiation Materials Corp., MA	lead pig 1/27/69
VF016	U235 5 GALLON CONTAINTER <0.01 C	12 X 12 X 14	1.170	22000	1.80	U 235	Ken McGee Nuclear Corp., OK	GE Bldg D - Shephard Lane - Evandale, OH
VF017	CO 57 10 MC	1.5 X 1.5 X 3.5	0.004	120	0.02	CO 57	Radiaiton Materials Corp., MA	lead pig
VF018	GAMMA SPECTROMETRY STANDRDS MODEL	3 X 6 X 1	0.010	150	0.05	CO60,MN54	Chem Troc	Wooden box; Additional Isotopes: CO 60, MN54,
VF019	SOURCE #38 STANDARDS	3 X 6 X 1	0.010	1500	0.30	Na22,Mn54	Baird Atomic	Wooden Box; Additional Isotopes: Co57, Cs137,
VF020	CO 60	3 X 3 X 1	0.005	9000	1.50	Co60	National Bureau of Standards	Cardborad box April 15, 1969
VF021	BA237 CS137	3 X 3 X 1	0.005	14000	0.80	Ba137,Cs137	National Bureau of Standards	12/2/68 Cardboard Box
VF022	SR90	3 X 3 X 1	0.005	90	0.04	SR 90	Radiation Materials Corporaton	in plastic box
VF023		1 X 1 X 0.5	0.000	8000	1.20	Al26,Ba133		4 standards in containers 12/17/65; Additional

#	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
VF024	CL36	3 X 3 X 1	0.005	50	0.03	Cl36	Radiation Materials Corp	0.0354uc 12/6/68 8-002
VF025	SE-1176-001 4891MCI	3 X 3 X 5.5	0.030	120	0.02	Se75	No Name	Lead Pig 11/15/76
VF026	CO60 7MCI	9 X 9 X 11	0.520	4000	0.02	Co60	Na Name	Lead ig
VF027	TALLIUM-182 0.2MR NOSE CAP	7 X7 7 X 10 BOX	0.300	150	0.06	Tallium 182	GE	Taken from RSO (Joe Andrea U8600, 12/21/87)
VF28	TI204 <50MCI	10.5 X 8 X 4	0.200	100	0.08	Tl 204	Twin City Testing Corp	Wooden Box
VF029	TA 182 5MC	1575 GRAMS		16000	6.00		Montsano Research Corp., OH	12/12/74 Metal Can
VF030	TA 182 5 MC	4 X 4 X 7	0.070	400	0.14	TA 182		Jack McFadden 4/15/91 Li Pig
VF031	TH282	6 X 6 X 9	0.190	2000	0.70	Th282	Montsano Research Corp., OH	Reusable can <1MCi
VF032	TA182 15MCI	4 X 4 X 7	0.070	100	0.06	Ta182	None	ORR-1 4/15/81
VF033	CS137 <30MCI PM147 <50 MCI	6 X 10 X 3	0.100	5000	3.00	Cs137	Twin City	Box 2 Sources
VF034	KR85 300MCI 2 IN SLEEVE	12 X 8 X 5	0.280	10000	40.00	Kr85	None	Box
VF035	CO57 >0.3MCI CO60 > 1.0 MCI	3 X 3 X 6	0.030	15000	4.00	Co57 Co60	None	1/7/69 Serial #1121.1
VF036	URANYL ACETATE 1 LB BOTTLE POWDER	3 X 3 X 6	0.030	1500	0.40	Uranium	J. T. Baker	
VF037	THORIUM NITRATE 4 OZ BOTTLE	2 X 2 X 4	0.010	7000	0.60	thorium	Fisher Scientific	
VF038	GLASS BOTTLE CAT # 410	2X2X4	0.010	1000	0.10	Uranium	Fisher Scientific	
VF039	PRESSURE GUAGE	17X7X8	0.550	50	0.02	H3	Matheson	Compressed cylinder regula
VF040	118 URANYL ACETATE	3X3X6	0.030	3000	0.12	Uranium	Baker	
VF041	CO60 10MCI (1268) 4SOURCES 1"X.25"	4X4X6.5	0.060	4500	1.40	Co60	none	Lead pig
VF042	THORIATED MAGNESIUM 2% 8LBS.	6X4X14	0.190	7000	0.70	Thorium	none	
VF043	53GMS URAN.ACET. 13-URAN. NITR.	4X3X8	0.050	1500	0.13	U & thorium	Fisher,Baker,Ventron,Polysci.	6 glass bottles additiona description - 25gms. Thori

#	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
VF044	4CS137,22MICRO CI; CO60-1MICROCI	1X.25	0.000	1500	1.40	Cs137	none	Lead pig,2-Mn54, 1-Co57
VF045	MGTH 3BAGS	12XBX2	0.100	400	0.04			.65 lbs scrap from preassembly 11-14-88
VF046	TA 182 <1MICRO CI	2X2X6	0.014	40	0.04	ta182	Calibration	3-29-80 taken from Joe D'Andrea
VF047	CYLINDER TANK STRAP	2X3X6	0.021	40	0.04		Fisher	
VF048	NATIONAL LEAD CO., URANIUM .6 LBS	4 X 4 X 5	0.050	50000	0.30	Uranium	National Lead Co., Albany, NY	Tin Can Given to us by Dr. S> Heiman
VF049	BOX OF SCREENS	7 X 5 X 2	0.040	0	0.03		Isotope Prod. Lab., Burbank,CA	Model X Kit Wooden x-ray box generator
VF050	TL204 <100UCI	1 X 3 X 7	0.010	150	0.04	Tl203	None	Model HH4 S-N T698 10/12/77 Schoogem
VF051	THORIA <1MCI	9 X 1/16DIAMETER	0.004	60000	4.00	Thoria	None	Wooden sticks 2 tubes Additional Description: 17
VF052	TA182	1.5 X 3 X 3	0.008	100	0.03	Ta182	9E	Irradiated c-c Taken from Joe D'Andrea 2/25/88
VF053	SR90 10CI STEEL PIPE	9 X 9 X 12	0.560	150000	120.00	Sr90	None	4/8/66 Steel Pipe
VF054	IONIZATION CELL 15 MC MODEL	2.5 X 2.5 X 5	0.020	100	0.03	Nickel 63	Tracor Inc., Austin TX	Serial # 4021 9/8/78
VF055	TOOLS PLYERS AND SCISSORS	8 X 5 X 11	0.020	40	0.04		None	
VF056	RING CLAMPS	11 X 4 X 2	0.050	40	0.01			
VF057	ELECTRONIC TUBES - BOX	1 X 4 X 1	0.002	40	0.04		Elect Prod Div, EG&G-Salem, MA	
VF058	SMALL WOODEN BOX	1 X 4 X 3	0.010	50	0.05	Pl239 stncls	Eberline, Santa FE, NM	Addl Isotopes: Plutonium PZ39 - PZ38(8.25x10⁻⁴uCi)
VF059	BETA REFERENCE 5 SOURCES	1 X 6 X 3	0.010	50	0.03	Pa234.011uC	New England (MA) Nuclear Corp	Cat #1225 Addl Isos: 14c-12uCi 5/60;
VF060	SWITCH BOX	7 X 2 X 5	0.040	40	0.04			
VF061	PM147 THICKNESS<75UCI	7.5 X 7 X 1	0.030	50000	0.06		None	Model HH4 Serial #5800
VF062	PA234-.05UCI;BI210-.1UCI;C14-.15UCI	1.5 X 3 X 1.5	0.004	1500	0.04	Pa234,Bi210	Atomic Access Inc., VllyStrmNY	All Beta emitters Additional Isotopes: C14

#	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
VF063	FE55 - 10UCI 12/17/68			50	0.05	Fe	Rad Materials Corp., WalthamMA	
VF064	THORIUM FILINGS HM2A-T8 >25 LBS	13 X 2.5 X 2	0.040	1000	0.02	Thorium		
VF065	THORIUM 6/24/88 230MG TH .25LBS	13 X 2.5 X 2	0.040	1000	0.02	thorium(bag		
VF066	HACKSONS CLAMP	16 X 6 X 4	0.200	40	0.04			
VF067	CARBON DISC	6 X 1	0.003	40	0.04			
VF068	MGTH CUTTINGS	10 X 13 X 1	0.080	100	0.04	MgTH		
VF069	NITRIC ACID 32ML	1.5 X 1.5 X 4 (1:4)	0.005	80	0.04			
VF070	NITRIC ADID	1.5 X 1.5 X 4	0.005	80	0.01			
VF071	S S DONUT	2 X 2 X .75	0.004	40	0.03			
VF072	DISC	3 X 3 X .25	0.004	40	0.03			
VF073	DISC SOURCES ENVELOPE	3 X 5 X .125	0.001	80	0.03	14C Sample		
VF074	FILTER PAPER	1.5 X .5 X .5	0.000	40	0.06			
VF075	MGTH .85LBS 4/1/88	14 X 13 X 13	0.040					
VF076	CONTROL BOX	2 X 8 X 6	0.050	40	0.20	mixed-175uC	HRAH	Exposure box
VF077				150	0.20	Am,T41		Am241, #154 Sn1097 10uCi
VF078	SR90 .0UCI	1 X 1 X 2	0.001	40000	0.20	Sr90		#49
VF079	SOURCE IN BOLT AM241 2UCI	.75 X .25 X .25	0.000	250000	0.01	Am241		
VF080	AM241 .11UCI	.25 X .25 X1.5	0.000	40	0.13	Am241		
VF081	AM 241 1/1/60 1UCI	1 X 1 X .25	0.000	40	0.30	Am241 1/60	Isotope Prod Lab, LA CA	0.094 Mc 8/6/70
VF082	SR90	1 X 1 X .50	0.000	30000	0.14	Sr90	Isotope Prod Lab, LA CA	0.094 Mc 8/6/70
VF083	AM241	1 X 1 X .5	0.000	1000	0.03	Am241	E. M. C.	2/3/65
VF084	AM241	1 X 1 X .25	0.000	3000	0.05	Am241	Isotope Prod Lab, LA CA	4124-1 1/1/69'
VF085	SR90 .1UCI	1 X 1 X .25	0.000	3000	0.16	Sr90	Isotope Prod Lab, LA CA	

#	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
VF086	14C (X2) .174UCI; .13UCI	(2) 1 X 1 X .5	0.000	18000	0.13	14C	New England Nuclear	(.13uCi = Gamma: .17 and Mfg: Isotope Prod Lab)
VF087	AM241 1.1UCI	1 X 1 X .5	0.000	2500	0.30	Am241	Isotope Prod Lab	
VF088	CO60	1 X 1 X .5	0.000	10000	1.70	C60 10.5uCi	Isotope Prod Lab, LA CA	1/1/69
VF089	AM241	1 X 1 X .5	0.000	10000	0.30	Am241 1uCi	Isotope Prod Lab, LA CA	
VF090	CO60 .0515UC 5/6/60	.75 X .75 X .5	0.000	2500	0.30	Am21 1uCi	Isotope Prod Lab, LA CA	
VF091	TL204 .1UCI	.75 X .75 X .5	0.000	200	0.20	TL204		
VF091	U238	.5 X .5 X .25	0.000	150	0.20	U238	Isotope Prod Lab, LA CA	
VF093	U235 500 MG 10/1/70	.75 X .75 X .5	0.000	1000	0.30	U235		
VF094	URANYL NITRATE SOLUTION 100ML	3 X 3 X 8	0.042	150	0.20	Uranium		
VF095	URANYL NITRATE SOLUTION 100ML	5 X 2 X 2	0.010	200	0.10	Uranium		
VF096	(12) S>S>WIEGHING DISHES PLANCHET	2 X .0625	0.000	40	0.10			Additional Description: +2'0" rings, cap
VF097	MGTH RAW	6 X 8 X .25	0.007	8000	0.20	MgTH		
VF098	(A)URANIUM (B)THORIUM NITRATE	12 X 12 X 12	1.000	100000	3.00	U, Po210	(A) Inorganic Inc; (B) Fisher	4/71 (A)100 grams (B)100grams-5mCi in reusable
VF099	NEW METAL FIXTURES	3.5 X 3.5 X 3.5	0.018	50	0.20	?		
VF100	2 DETECTORS	5 X 2.5 X 2.5	0.020	25000	0.30	Amonium	Pyrotronics, Inc. 11/65	Addl Beat: 40000 Addl MR/HR: .3 AddlIso: 50uCi 241 Addl
VF101	CERAMIC ROUND DISCS 1 BOX	4X4X6 .25 ROUND	0.060	0	0.15			
VF102	FUNNEL	6 X 5 X 2	0.035	0	0.00			
VF103	CONICLE HARD-DISC WARE	5 X 5 X 2	0.029	40	0.08	Pu23 90mCi		
VF104	CD 109 LIQUID	5 X 5 X 5	0.000	40	0.12	Cd 109		
VF105	6 GLASS SLIDES	3 X 2 X .25	0.001	40	0.03			
VF106	PIPE AND VALVE	13 X 1 X 2	0.020	40	0.10			

#	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
VF107	BAG OF (100) 1 INCH SCREWS	2 X 1 X .5	0.000					
VF108	PO210	1 X 1 X 1.5	0.000			Po210		Beta and Gamma =" Background"
VF109	AM 241 1CI	2.5 X 3 X 2	0.010	2000	0.70	Am241		In stainless cylinder
VF110	PU239 CAP PIPE	2 X 2 X 4	0.010			Pu239		Beta and Gamma = "Background"
VF111	RODS RA,TH,PM,C	1 X 1 X 5	0.003	300	0.07			
VF112	(2) AM241 .1UCI AND 12MCI	1 X 1 X 1.5	0.001	4500				Additional info on (1): 9/4/67 Beta="Background and
VF113	PU238 10MCI IN COLLAR	2 X 4 X .5	0.002	700	0.60	Pu238		
VF114	PLASTIC	3 X 3 X .5	0.003	40	0.03			
VF115	BETWEEN TWO WOODEN BLANKS	5.5 X 38 X 2	0.240	5000	1.40	Depleted U	Varlacoid Chem Co, Elizabth,NJ	
VF116	2 SOURCES KRYPTON 523-68 10UCI &	.5 X .25 X 1/21	0.000	110000	0.20	Krypton	I-Lite	in box Additl info on (2): Dim: 10x7x4; FT3:.16;
VF117	HYDROGEN IODIDE ANHYDROUS IN GAS	15 X 3 X 3	0.080	250	0.10	HI	Resrch Org-Inorg Chem Corp, CA	98%
VF118	TLDS	2 X 4 X 2	0.009	40	0.10		Teledyne Westwood Labs, NJ	
VF119	B SOURCE	.25" STANDARD	0.000	500000	1.00	B Source	?	Lead Pig 3 x 3 x 5
VF120	THORIUM OXIDE 20MR/HR			20000	0.70	Thorium		100 grams 4/11/80
VF120	THORIUM OXIDE 1-.5"DIM (CON'T IN	4 X 4 X 6	0.050	3500	0.40	Thorium		100 grams (Additional Description: 3 Metal Discs
VF120	THORIUM OXIDE		0.000			Thorium		
VF121	URANIUM OXIDE	3 X 2 X 3	0.010	1000	0.20	uranium	K & K Labs, Bollywoood, CA	50 grams
VF122	PU239 5UCI	1 X .5 X .5	0.000	100	0.04	Pu	Isotope Prod Lab, LA CA	
VF123	KR85 2 X 10^-3 CI	4 X 24 X 4	0.222	30000	0.60	Krypton	McDonnell Douglas Astronautics	Hunting Beach, CA 5lbs
VF124	1 BOX ELECTRONIC PARTS	12 X 12 X 8	0.666	100	0.10			Engineering parts for destructive testing
VF125	KR85 12 X 10^-3 CI	4 X 24 X 4	0.222	8000	1.50	Krypton	McDonnell Douglas, HB, CA	

#	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
VF126	CO63 3.6UCI 12/61	1 X 1 X .25		1000	0.50	Co60	Chemtrac Corp	
VF127	THORIUM 232	6 X 12 X 12	0.500	2000	0.80	Thorium		Wooden block 6 x 12 x 2
V128	THORIUN IODIDE	3 X 3 X 6	0.031	1500	0.50	Thorium		3 bottles .25 lb
VF129	THORIUN ROD 30 GRANS	3 X 3 X 10	0.052	3000	1.50	Thorium	Alpha Inorganics, Beverly, MA	
VF130	ELECTRONIC PARTS	6 X 4 X 1	0.014	100	0.05			1 bag circuit board
VF131	DEUTERIUM OXIDE 99% 100 GRANS	(IN BOX OF 8X8X16)	0.592	100	0.07	Deuterium	K & K Labs, Hollywood, CA	Brown glass bottles
VF131	URANIUM OXIDE	(IN BOX OF 8X8X16)		1500	0.35		K & K Labs, Hollywood, CA	100 grams
VF131	HAFNIUM TETRAFLUORIDE	(IN BOX 8X8X16)		100	0.07	Hafnium	Pennwault	Lot R-10-25-C 25 grams
VF131	URANIUN TETRAFLUORIDE	(IN BOX 8X8X16)		7000	0.50	Uranium	Research Org-Inorg Chem Corp	100 grams
VF131	BI106	(IN BOX 8X8X16)		100	0.07	Bismuth	Research Org-Inorg Chem Corp	100 grams
VF132	BAG PARTS, RING CLAMP, TOWEL,	12 X 15 X 3	0.312	3500	0.90		Fan Steel Inc.	9.5 lbs 2% thorium 10/26/87
VF133	TALLIUM STRAPS 12MR	12 X 12 X 5	0.416	100	0.09	Tallium	Metals Division, Baltimore, MD	12/21/87 Joe D'Andrea
VF135	4 ALPHATROMS MODEL 520 RA226 GAMMA	4 X 12 X 4	0.111	200000	90.00	Ra226		400 uGm
VF136	2 KR85 250UCI	(2) 18 X 2 X 2	0.083			Kr85	NuPRO and HOKE	Whiley 300 cc
VF137	2 ELECTRO STATIC CLASSIFIER MODEL						Thermo-Systems, Inc.	No radioactivity
VF138	4 GRAPHITE SPHERS	5 X 5 X 12	0.173	100	0.20			Reusable container
VF139	2 SPHERES GRAPHITE CASING	2 X 2 X 5	0.016	40000	15.00			10/24/86 - 50 10/24/86-51
VF140	9 ROLLS THORIUM OXIDE SPHERES 1"	2 X 2 X 8	0.018	60000	25.00	Thorium		1" spheres
VF141	CASE PROBE SET 1UCI SR + Y90	12 X 12 X 14	1.167	100	0.20	Srty90	UPA Inc. Woodside, NY	From: Ted Ferlein; Control #416831; 6/21/83
VF142	CERAMIC SPHERE 2"	4 X 4 X 6	0.055	100	0.30			10/24/86 86 10/24/86 87
VF143	BOX HARDWARE RING STAND IMPACT SPHERS	12 X 12 X 14	1.167	17000	4.00			

#	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
VF144	2 THORIUM OXIDE SPHERES 753GRAMS	4 X 8 X 4	0.074	8000	2.00	Thorium		
VF145	THORIUMOXIDE (BOX) SPHERES 264 GRAMS	6 X 10 X 15	0.520	35000	20.00	Thorium		1.5" spheres 40 spheres 10/24/86
VF146	BOX OF THORIUM OXIDE SPHERE	6 X 10 X 15	0.520	32000	9.00			11 packets Weight = 2.0 grams
VF147	BOX METAL PARTS THORIUM OXIDE	2 X 6 X 4	0.027	48000	16.00	No, Thorium		No, IR
VF148	BOX OF BOTTLES (5)	4 X 7 X 7	0.113	20000	2.00	Thorium	Fisher Scientific	Thorium Nitrate .5 lb
VF148	URANYL ACETATE			2000	0.30	Uranyl	Baker Chemical, Phila,PA	.25 lb
VF148	THORIUM NITRATE			46000	1.50	Thorium	Atomergic Chems, Long IslandNY	1 lb C8169
VF148	URANYL NITRATE	IN BOX		1500	0.30		Fisher Scientific	1 oz
VF148	UNKNOWN	IN BOX		1000	0.20	?	?	#136 1 oz
			14.795	2328950.00	421.18			

NUMBER	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
ISH01	GAMMA CALIBRATOR	14 X 6 X 6	0.292	2000.00	7.00	Cs137	EON Corp, Brooklyn, NY	Model 64-764
ISH02	WASTE FROM SIGE DISKS	5 X 5 X 3	0.043	60.00	0.05			Internal disks (GE)
ISH03	SILICON GERMANIUM DISKS	4 X 4 X 2	0.018	150.00	0.03			.5" planchets in three petri dishes
ISH04	C14 WAFER SOURCE	3 X 3 X 1.5 BOX	0.000	100.00	0.04	C14	Eberline	3500 CPM
ISH05	TRITIUM CHROMATOGRAPHIC TAPE	2 X 3 X .75	0.000	100.00	0.03	Tritium		
ISH06	STATIONMASTER BRUSH	(3) 2.5 X 2 X 0.5	1.447	100.00	0.03	Polonium	Nuclear Products Company	El Monte, CA
ISH07	GD203 0.5%; 2.5%; 4%	3 X 2 X 1	0.000	15000.00	0.20	GD203	Unit Process Assemblies	7/24/78 2.5 MR at surface
ISH08	RA-D <10UCI	2 X 2 X 0.5 (BOX)	0.000	7500.00	0.20	RD		S/N 18028; Mod 10; ICM 2-75 MX 4071 3/79
ISH09	TL-204 <100MCI	2 X 2 X 0.5	0.000	375.00	0.07	TL204	CH	S/N 16384; M/X 4072 3/2/76
ISH10	PM147 <50MCI	2 X 2 X .05	0.000	150.00	0.03	PM 146	CH	S/N 14315
ISH11	URANIUM ACETATE BOTTLE 100 GRAMS	1.5 X 1.5 X 5	0.000	1500.00	0.40	Uranium		Powder
ISH12	URANYL NITRATE CHRYSTAL	2 X 2 X 4	0.000	250.00	0.07	Uranium	Baker Chemical Company	20 grams
ISH13	TH METAL POWDER	2 X 2 X 2	0.000	1000.00	0.20	Thalium		325 MEsh
ISH14	THORIUM ROD	0.1 X 0.1 X 9	0.000	100.00	0.03	Thalium		11.45 grams
ISH15	THORIUM MAGNESIUM FILINGS	9 X 12 X 1 BAG	0.063	100.00	0.07	Thalium		100 grams
ISH16	6 SOURCES (PLEASE SEE COMMENTS) IN BOX	4 X 6 X 2 (OF BOX)	0.028	50000.00	1.20		Isotope Product Lab	Co60, Na22, Pa55, C... Cs137 Lead 238
ISH17	7 SOURCES (SEE COMMENTS)	2 X 7 X 1	0.000	4000.00	0.15		Chemtrac	Na22-CT2006,Cd109-CT2001 Cs137-CT2004,Co60-Ct2007 Mn54-CT2005,Ba133-CT2006
ISH18A	U238 AND CO60	2 X 7 X 1	0.000	1000.00	0.05		Baird	(1) 3 uCi (2) .0058 uCi
ISH18B	CL36 AND U238	2 X 7 X 1	0.000	1000.00	0.05		Baird	(3) .022 uCi (4) 3 uCi
ISH18C	SR90 AND C14	2 X 7 X 1	0.000	1000.00	0.05		Baird	(5) .0292 uCi and (6) .0192 uCi

NUMBER	DESCRIPTION	DIMENSIONS	FT3	BETA CPM	GAMMA MR/HR	ISOTOPE	MANUFACTURER	COMMENTS
ISH19	CS137 8UCI	3 X 6 X 1.5	0.016	30000.00	4.00	Cs137	Isotopes Prodcuts Lab	
ISH20	STATIC METER 3M - 703	9 X 7 X 2	0.073	100.00	0.05		3M Company-Nuclear Products	Tridium H3 200 mCi
ISH21	SOURCE SET MODEL S94-4 PLUTONIUM 60 ↳?	15 X 12 X 2	0.210	250.00	0.05	Plut 60 ↳?		Additional Beta CPM: (2) 1000 (3) 9000 (4) 100000
ISH22	2 SOURCES IN BOX - UNKNOWN IN LEAD PIGS	13 X 10 X 5	0.376	10000.00			TRW Systems Group	Beta above is for series 5 Series 6 Beta is 15000 407656-3
ISH23	TRANSISTOR (16)	9 X 6 X 4	0.125	100.00	0.05		E G & G, Salem, MA	
ISH24	21 BOXES TRANSISTOR	8 X 8 X 8	0.296	100.00	0.05		E G & G, Salem, MA	
ISH25	MN54 1MCI CAN - 1 LITER	12 X 12 X 12	1.000	37000.00	14.00	Mn54		
ISH26	TRANSISTORS - 7 BOXES	4 X 3 X 5	0.035	100.00	0.05			
ISH27	NI63 8MCI 02-1972-00	8 X 3 X 7	0.097	100.00	0.00	Ni63	Barian Instuments Division,	12/77 A568
ISH28	WASTE GLOVES	2 X 4 X 4	0.019	100.00	0.05			
ISH29	HARDWARE	3 X 6 X 1	0.011	100.00	0.05			2790 52 MED-2
ISH30	MG CHIPS BAG	8 X 3 X 1	0.014	100.00	0.05			
ISH31	KR85 4.9MCI	18 X 5 X 5	0.260	2000.00	0.05			250 psi Cylinder 5/18/89
ISH32	STATIC METER 3M-MODEL 703 NO3115	9 X 7 X 2	0.073	100.00	0.65		3M Co., Nuclear Products	h3 Tridium (box) Box dimensions: 14 x 12 x 100 mCi
ISH33	2 SOURCES RED CONTAINERS	.375"DI 1.5 X 3 X1.5	0.000	100.00	0.05			
ISH34	CONTAMINATED GLOVES	4 X 4 X 2	0.018	100.00	0.05			
ISH35	STATIC METER MODEL 703	BOX: 14 X 12 X 14	1.360	100.00	0.05		3M Co., Nuclear Products	H3 Tridium
ISH36	SIGE CHIPS RADIATION WASTE 1 BAG	12 X 12 X 12	1.000	200.00	0.05			
			6.874	166135.00	29.25			

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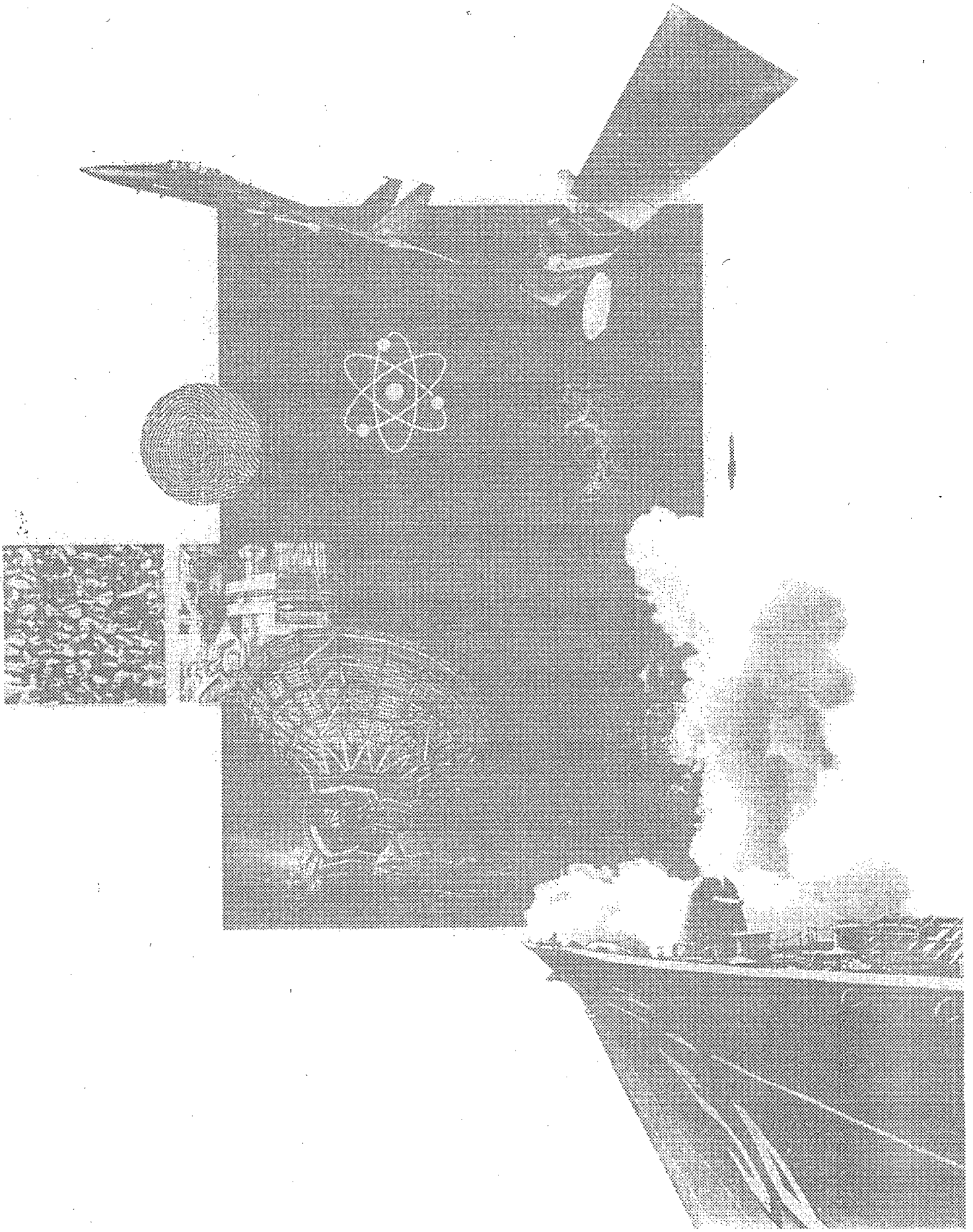
Martin Marietta Corporat 1998 Annual Report



Martin Marietta Corporation designs, manufactures, integrates and operates systems and products in leading-edge technologies, including aerospace, electronics, information management and energy, and produces materials for construction and industrial applications.

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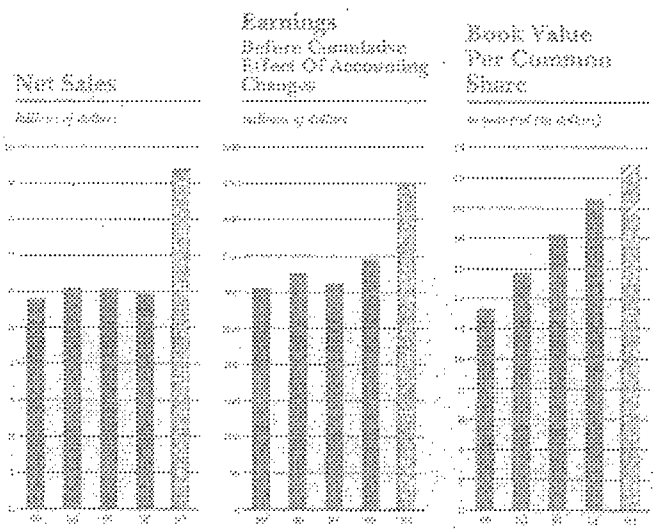
Financial Highlights

dollars in millions, except per share	1993	1992
Sales	$9,455.7	$9,354.3
Earnings before cumulative effect of accounting changes	$480.3	$545.4
Net Earnings	$29.8	$545.4
Earnings Per Share before accounting changes, assuming full dilution	$5.89	$8.60
Return (before accounting changes) on average equity	19%	18%
Cash dividends per common share	$.87	$.795*
Debt-to-capitalization ratio	39%	40%
Common shares outstanding at year-end	95,697,411	94,458,140*
Number of stockholders	32,700	35,772

*Adjusted to reflect the 3-for-1 stock split in September 1993



Fully diluted book value per share (number of stockholders' equity, minus treasury stock, plus conversion of stock options)

To Shareowners:

The year 1993 was momentous for Martin Marietta Corporation. As a result of combining with GE Aerospace, the Corporation doubled in size, thereby producing record sales which, along with a strong balance sheet, have positioned Martin Marietta for continued success in a difficult defense environment and for growth in commercial, civil government and international markets.

Sales of $9.4 billion fueled earnings of $450 million, or fully diluted earnings per share of $3.80, before the after-tax charge of $429 million for the cumulative effect of changes in accounting for post-retirement and post-employment benefits. The impact of these required accounting changes resulted in net earnings of $21 million. Debt-to-capitalization, which increased to 44% as a consequence of our consolidation with GE Aerospace, has been reduced to 39%, even after allowing for the accounting changes.

Backlog of firm orders reached an all-time high of $16.7 billion, not including $9.7 billion in yet-unexercised contract options and approximately $12 billion in equivalent sales under Department of Energy contracts. The Corporation's financial health, including cash flow, remains sound and bodes well for possible future acquisitions, investment in existing businesses, debt reduction and other opportunities for increasing stockholder value.

1993 also marked the third year of the Corporation's "Peace Dividend" strategy, designed to meet the challenges of today's aerospace and defense markets and position Martin Marietta for the next century. This long-term approach to Martin Marietta's diversified, high-technology businesses calls for:

* growing our share of the defense market through cost competitiveness, technology advances and by exploitation of opportunities for acquisition and consolidation;
* continued expansion into closely related civil government and commercial markets, especially in the areas of information systems and technical services; and
* enhancing share value by maintaining a strong balance sheet and pursuing avenues that promise good return and further reward for the Corporation's stockholders.

The combination with GE Aerospace in April 1993 made Martin Marietta the world's largest aerospace/electronics company and was a watershed event in the history of the Corporation. That transaction was followed eight months later by an agreement, now pending government approval, to purchase General Dynamics' Space Systems Division, producer of the Atlas space launch vehicle and the high-energy Centaur upper stage booster.

This acquisition, expected to be completed in the first half of 1994, will position Martin Marietta to produce space launch vehicles in the intermediate-size payload range, complementing the Corporation's long-established position in the large payload market with the Titan family of heavy-lift vehicles.

Combining certain aspects of the Titan and Atlas programs also presents opportunities for cost savings that are expected to benefit the national space and defense programs.

We will continue to seek acquisition opportunities that further position Martin Marietta for the future in its core markets. As in the past, however, our interest will focus on acquisitions that promise a strategic fit with Martin Marietta, enhance growth, are appropriately priced and assure long-term value to the Corporation's stockholders.

In a notable expansion of the Corporation's commercial aerospace business,

GE Aircraft Engines signed an agreement late in the year naming Martin Marietta the sole-source supplier of thrust reversers for GE's CF6 family of jet engines. This agreement will more than double the Corporation's annual thrust reverser sales, making Martin Marietta one of the world's leading suppliers in this billion-dollar annual market.

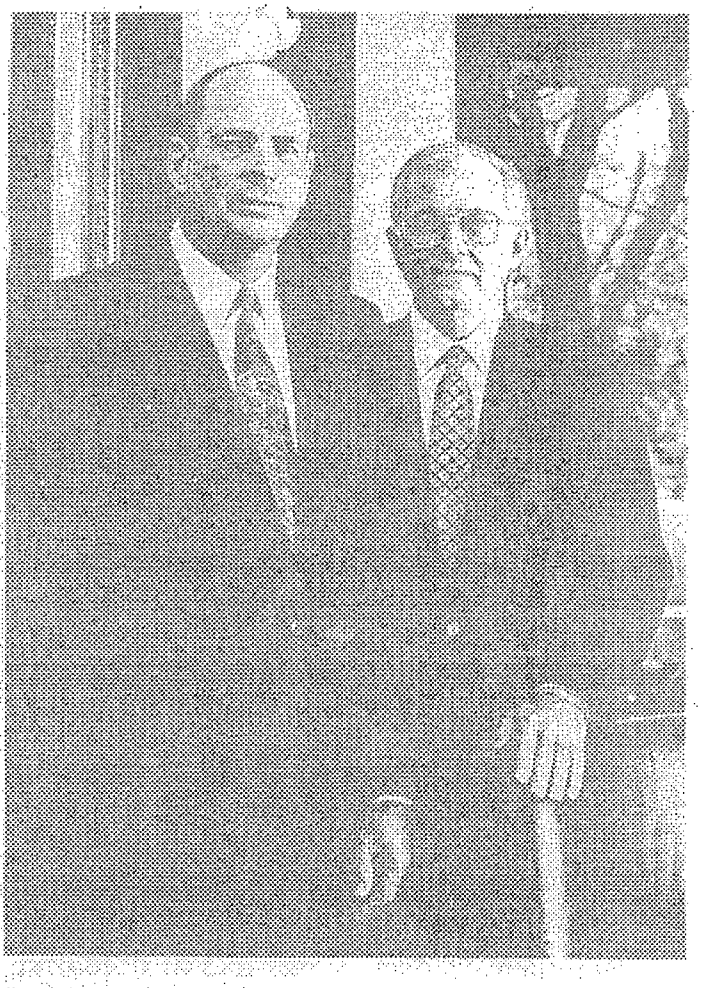
These strategic moves, as well as strong sales and backlog of orders, have underpinned the 33% total return enjoyed by holders of Martin Marietta common stock during the year. Since the day prior to our announcement of the GE Aerospace transaction in late November 1992 to year-end 1993, total return to stockholders exceeded 54%. During the year, the Corporation's annual common stock dividend paid was increased for the 21st time since 1961.

In another move to enhance the value of the Corporation's stock, Martin Marietta Materials Group was incorporated as a wholly owned subsidiary of the Corporation and a registration statement was filed with the Securities and Exchange Commission for an offering of its common stock. Martin Marietta Materials is one of the nation's largest producers of crushed stone, sand and gravel for construction markets as well as a major supplier of magnesia-based products, and this offering should allow the subsidiary to achieve a market value comparable to its standing in its industry. Martin Marietta Corporation will retain slightly more than 80% of the new company's outstanding stock.

The major management challenge of 1993 was Martin Marietta's organizational consolidation with GE Aerospace, which has proven to be remarkably successful, primarily due to the exemplary teamwork of all our employees. Within a month after the transaction closed, operating units from the two organizations were consolidated into fully integrated, market-related groups. Management talent from both organizations was chosen for key positions in the new organization.

The ongoing consolidation activities are guided by two simple formulas describing what we believe to be the essential arithmetic for merging two organizations: with regard to cost, 1+1=1½; with regard to market synergy, 1+1=3.

Facilities consolidations, announced in September 1993 and proceeding on schedule toward implementation, will reduce capacity by approximately five million square feet. The restructuring, together with other consolidation activities, is expected to save the Corporation more than $1.5 billion in net operating cash over the next five years alone.



With the GE Aerospace combination, we have created a new corporation with extraordinary technological breadth, capable of winning business neither organization might have considered alone. For example, the Services Group's competitive cost structure was combined with Aero & Naval Systems' technical experience to win the contract to continue maintenance of sonar arrays for the Navy. The elements of our corporation already are sharing personnel, technical information, capabilities and equipment for existing programs and developing markets for new business. Expanded buying power is being exploited with pooled purchasing agreements, and products are being adapted for new markets.

Fully one-third of the new company's sales is in civil government and commercial sectors. Of this, work for international customers now accounts for approximately 18% of sales. The addition of GE Aerospace also resulted in Information Systems and Services Groups reaching the critical mass necessary to compete effectively in growing global markets.

Aerospace and defense remain significant markets for Martin Marietta. We are determined to expand our

share of this business, as evidenced by our 1993 business and contract activity. Although 1994 is expected to be another challenging year for these markets, with defense programs still being cut and the civil space program basically flat, we believe, as we have for nearly a decade, that the Department of Defense budget will reach its low point by about 1997.

The Energy Group for some years has managed Department of Energy facilities in Tennessee, Florida, Kentucky and Ohio. With the end of the Cold War, these operations have assumed new responsibilities for transferring technology into the private sector and for aggressively marketing nuclear fuel for utilities throughout the world. Martin Marietta continues to seek opportunities for growth in this core business, and in 1993 the Corporation was awarded a contract to manage the Department of Energy's Sandia National Laboratories, headquartered in Albuquerque, New Mexico. Also, as part of the combination with GE Aerospace, Martin Marietta assumed responsibility for managing Knolls Atomic Power Laboratory near Schenectady, New York, for the Navy and the Department of Energy.

Martin Marietta's performance in development, production and support of major defense, space and civil government programs as well as commercial projects is reported in the Operations Review that follows. However, the year was not without its disappointments. The Corporation's long and proud history of Mission Success was interrupted by the failure of several important space missions.

In response, the Corporation convened an independent review team comprising Martin Marietta senior engineers and outside experts to focus on Mission Success processes and controls. The team delivered its report in December, and its recommendations are being implemented. Since mid-October, the company has recorded seven consecutive successful space missions: the first Titan IV/Centaur launch, which placed the Milstar communications satellite into orbit; the fifth Titan II launch, which successfully deployed the Deep Space Program Science Experiment spacecraft; a Defense Satellite Communications Systems spacecraft; the Telstar 401 spacecraft; and three space shuttle launches, which are fueled by the Martin Marietta-built external tank.

Martin Marietta Corporation continues its dedication to Mission Success and to ethical conduct in all its businesses. We are constantly grateful to the more than 62,000 Martin Marietta employees who practice these core values in their day-to-day activities. There have been extraordinarily difficult times for them. They have endured enormous change in their working lives and great uncertainty in the marketplace, yet they have stayed the course with dedication and determination.

We are also grateful for the wise counsel of Martin Marietta's Board of Directors, an exceptional group of individuals whose guidance and leadership have been essential in the successful execution of our corporate strategy.

Respectfully,

Norman R. Augustine
Chairman and Chief Executive Officer

A. Thomas Young
President and Chief Operating Officer

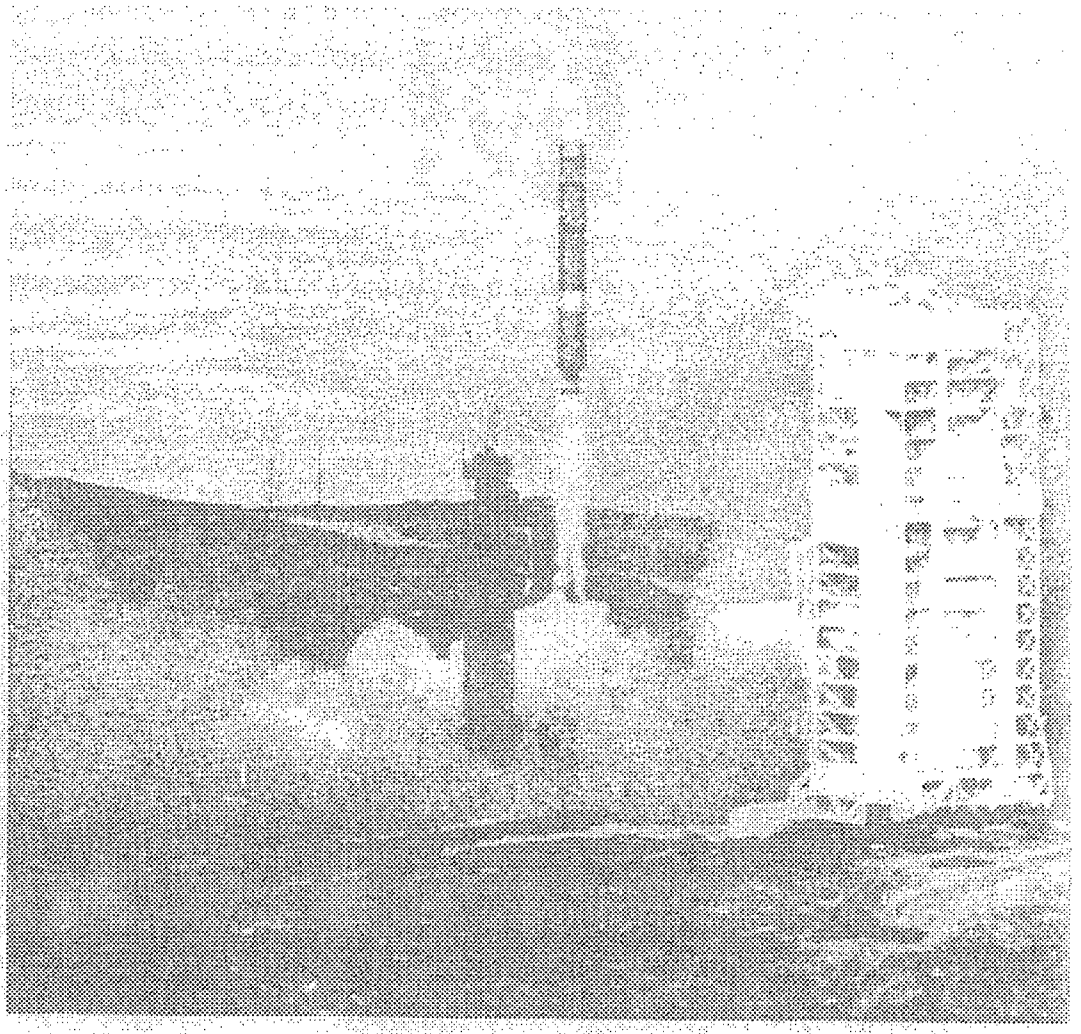
February 8, 1994

Martin Marietta Space Group is an industry leader in domestic and international space programs, producing the Titan family of space launch vehicles, the external tank for the Space Shuttle and satellites and spacecraft systems for military, civil government and commercial customers. The Group provides spacecraft payload integration services and ground-based support for space systems. Headquartered in Bethesda, Maryland, operating units and launch facilities are located in Colorado, Louisiana, New Jersey, Florida, California and Pennsylvania.

Peter B. Teets
President
Space Group

With the combination of the Martin Marietta and GE Aerospace businesses, the Corporation is capable of providing a full range of launch vehicle and satellite manufacturing and operations for commercial and government customers. Consolidations and cost-reduction initiatives within the Group, together with key productivity investments and continued development of next-generation satellite platforms, ideally position the Group within an extremely competitive marketplace.

Space Group, clockwise from top right: Titan IV, space launch vehicle; Signal from Inmarsat, designing and manufacturing satellite telecommunications payload; Telstar 401 starship; Magellan spacecraft, Earth.



Titan II space launch vehicle lifts off from Vandenberg Air Force Base, California. The Titan II has been launched since 1986, with nine more launches scheduled through the end of the decade.

Astronautics

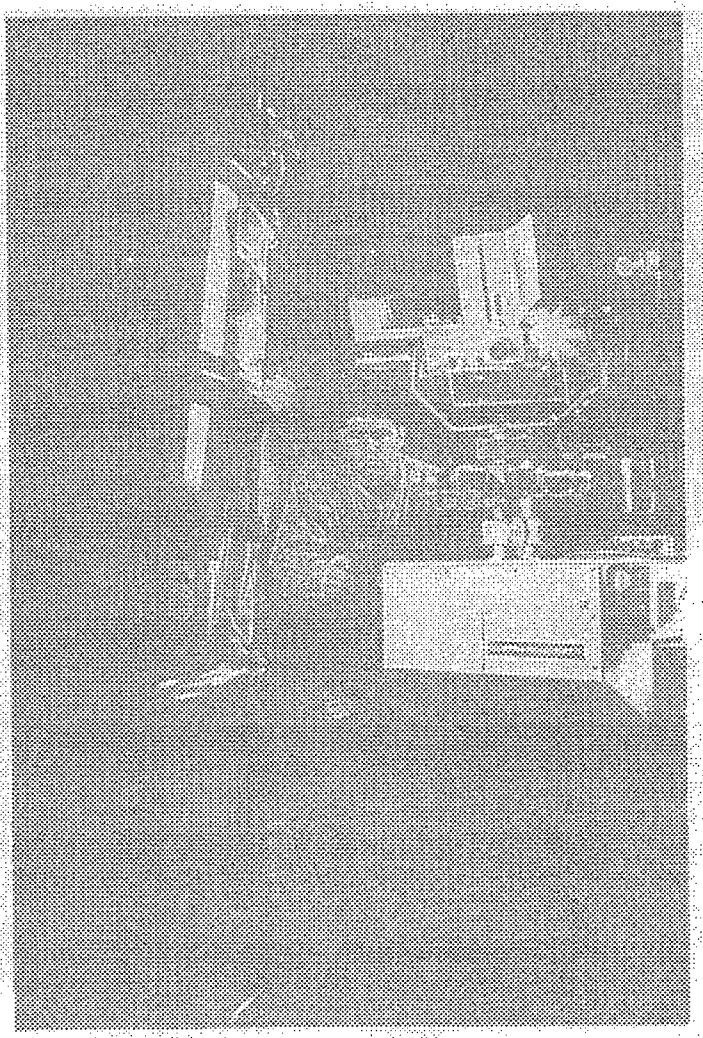
Titan IV, the largest expendable launch vehicle in the U.S. inventory, achieved a number of major development milestones in 1993. The solid rocket motor upgrade, which will provide increased capability and 25% more lift capability, completed final ground test firings. The new high-energy Centaur upper stage also completed testing, modifying Titan IV/Centaur the capability to place twice as much payload in geosynchronous orbit than any other launch vehicle. The first Titan IV/Centaur was launched successfully from Cape Canaveral Air Force Station, Florida, in early February 1994, placing the Milstar communications satellite into orbit.

The launch was the first Titan IV mission since a Titan IV failure in August 1993 due to a solid rocket motor burn-through. Also in 1993, Astronautics finished production of its 27th Titan IV core vehicle as part of a 41-unit contract.

Titan II's fifth space mission since 1986 — the first U.S. flight to the moon in more than two decades — was launched in early 1994. Its payload, the Deep Space Program Science Experiment spacecraft, also called "Clementine," is a joint program of the Ballistic Missile Defense Organization and the National Aeronautics and Space Administration (NASA). It also will perform a research flyby of the asteroid Geographos.

In support of the U.S. Air Force, three Peacekeeper ICBMs were test-launched from Vandenberg Air Force Base, California. Four more launches are planned for 1994. Work continued on the Multi-Service Launch System being developed by Martin Marietta to provide the United States a flexible, smaller launch system that can be used for a variety of purposes.

In September, Martin Marietta Astronautics' Transfer Orbit Stage (TOS) boosted NASA's Advanced Communications Technology Satellite, produced by Martin Marietta Astro Space,



In Denver, engineer Mark H. Rebeski sets a robot developed by Martin Marietta to inspect and monitor stored hazardous materials

Engineer Dean S. Lapin adjusts a fused fiber optic bundle for the Descent Imager Spectral Radiometer that will be used on the Cassini spacecraft's mission to Saturn. The instrument will collect data about the atmosphere and surface of Titan, one of Saturn's over moons.

into orbit from Space Shuttle Discovery following its launch from Kennedy Space Center, Florida. This was the second mission for the TOS and the first time it has flown on a space shuttle.

Earlier this year, Martin Marietta's Propulsion Laboratory was awarded Martin Marietta a contract to build the propulsion module subsystem for the Cassini spacecraft mission that will study Saturn, its moon Titan and the rest of the Saturnian system. Scheduled for launch in October 1997 on a Martin Marietta Titan IV Centaur rocket, Cassini will execute two gravity-assisted flybys of Venus, then one each of Earth and Jupiter before rendezvousing with Saturn in June 2004. The project is under joint development by NASA, the European Space Agency and the Italian Space Agency.

In October, the Army awarded Martin Marietta Astrophysics a contract to develop Block II of the All Source Analysis System. Under the six-year contract, Martin Marietta will act as the integrating contractor for this Department of Defense command and control system that is expected to significantly improve a battlefield commander's intelligence data and asset deployment capabilities.

Under a contract from the Advanced Research Projects Agency, Martin Marietta continued development of a robotic semautonomous surrogate vehicle that will navigate over difficult terrain while acquiring and recognizing potential targets.

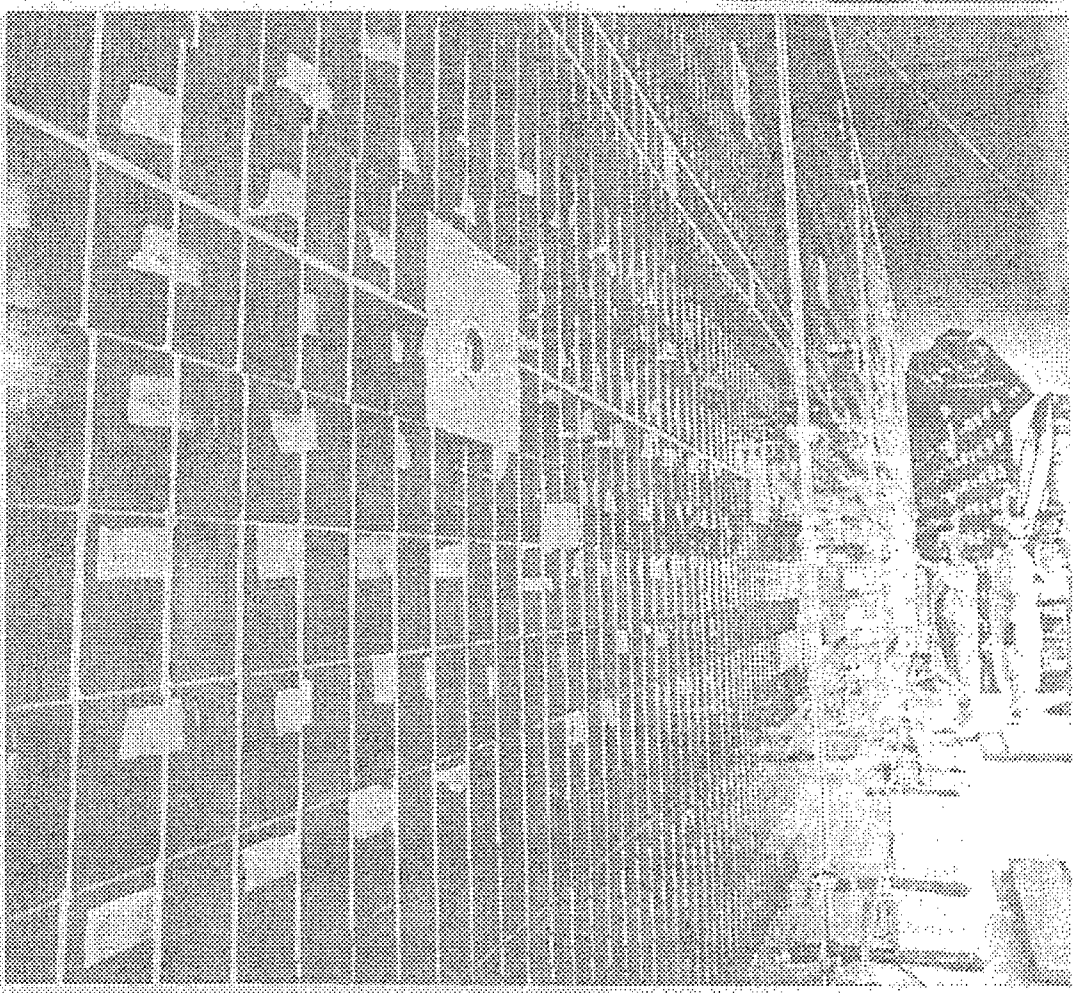
Work continued on upgrading the Air Force command complex inside Cheyenne Mountain in Colorado. Under the Granite Sentry program, Martin Marietta is applying state-of-the-art software and associated systems to improve efficiency and reduce operating costs at the joint North American Aerospace Defense Command and United States Space Command facility.

When complete, the upgraded facility will provide real-time integration and display of missile, space and air defense data, supporting the assessment of air and missile threats to the United States.

In the area of defense conversion, Martin Marietta is working with Rose Health Care Systems of Denver, Colorado, to investigate the use of photonics for pre-screening mammograms. The technology may enable the identification of tumors invisible to the human eye.

Martin Marietta also is under contract to the federal Department of Transportation to apply aerospace technologies such as those developed for semiautonomous vehicles to the Intelligent Vehicle Highway System program.

Technicians William L. Cooper, left, and Richard E. Hart from Martin Marietta Astro Space's East Windsor, New Jersey, facility examine solar panel sets on the Telstar 401 communications satellite, one of three being produced for AT&T. The first was successfully placed in orbit in 1992.



Astro Space

(L) Description: Telstar 401, the first of three advanced communications satellites for AT&T, was launched. Telstar 401 will be used extensively for many educational programs, offering at reduced costs. Users including the Satellite Educational Resources Consortium, the Public Broadcasting Service's Ready to Learn and Adult Learning Service and the National Technological University. Telstar 401 is the first Series 7000 spacecraft, the newest and largest of Martin Marietta's family of communications satellites. Telstar 402 is planned for launch in 1994, and launch of Telstar 403 is under consideration.

Series 7000 spacecraft include much advanced technical features such as jet thrusters that consume less fuel for station-keeping, thereby extending spacecraft life, and variable-output solid-state power amplifiers offering increased mission flexibility.

INTELSAT, the International Satellite Consortium, ordered three more INTELSAT VII satellites in 1993, bringing total orders for Series 7000 satellites to 10.

Two Defense Satellite Communications System III spacecraft were launched and deployed successfully in July and late November, continuing a record of communications support to the U.S. Armed Forces uninterrupted since 1982.

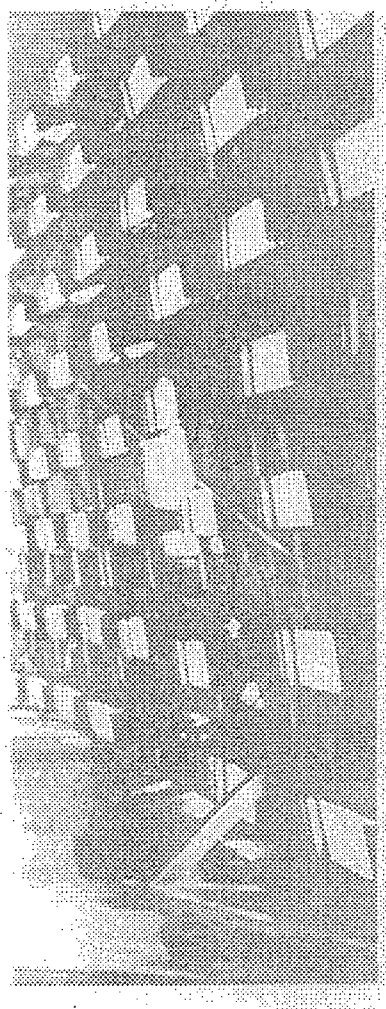
Martin Marietta's color video camera for the Space Shuttle made its first flight during the Hubble repair mission. The Corporation has a contract to deliver 40 cameras and 12 monitors for use on the Shuttle orbiters.

Launches scheduled for 1994 include two Global Geospace Science satellites for NASA, the BS-3N television direct broadcast satellite for Japan and NOAA-J, the latest in a series of more than 30 civil and military weather satellites that began in 1960 and is expected to continue into the next century. The first of four Inmarsat-3 spacecraft for the International Maritime Satellite Consortium is scheduled for launch in 1995.

Astro Space's long involvement in building environmental satellites continues with the Mission to Planet Earth EOS-AM, the first in NASA's Earth observing system, due to be launched in 1998.

Martin Marietta is continuing to develop the A2100 spacecraft, which will serve as a basic platform for the next generation of communications satellites. The A2100 will offer increased capacity at lower weight, fewer parts and reduced time between order and delivery, which means lower cost without sacrificing

Thomas W. O'Brien and Tracy M. Cunningham, foreground, both of whom were members of Martin Marietta Astro Space in Valley Forge, Pennsylvania, prepare Air Force defense communications satellites for testing prior to shipment.

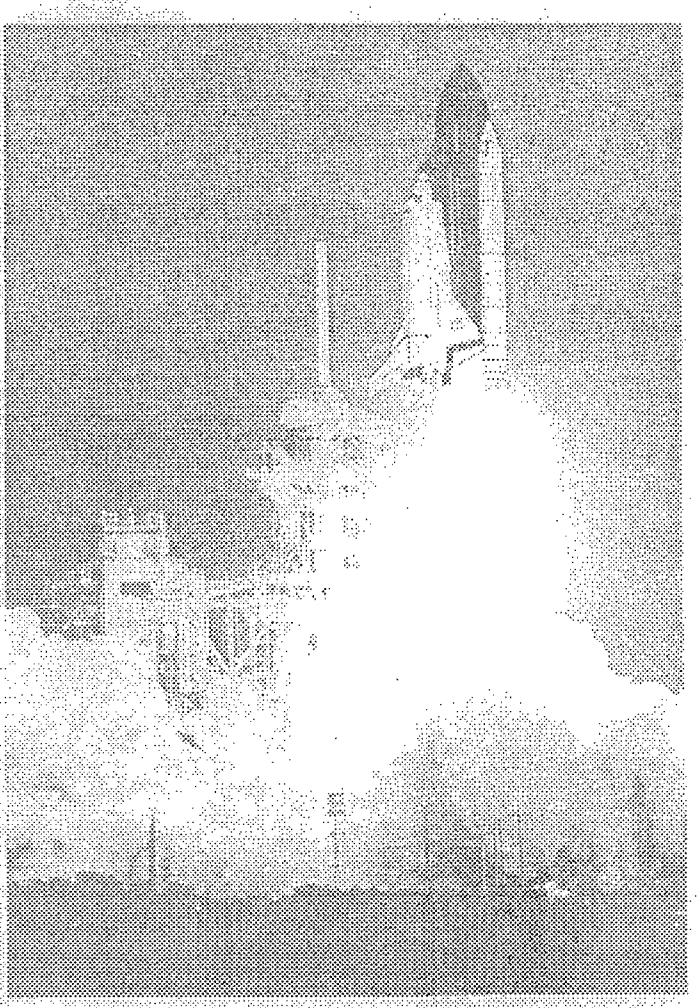


Manned Space Systems

Martin Marietta Manned Space Systems celebrated its 20th year as prime contractor on the Space Shuttle External Tank project at NASA's Michoud Assembly Facility in Louisiana. Over these years, the Corporation has produced 68 external tanks, including four delivered ahead of schedule in 1993. Current production plans call for an additional 34 tanks through the year 2000.

The 154-foot external tank is the largest element of the shuttle and has a dual role during the first eight and one-half minutes of each launch. It feeds cryogenic liquid propellants to the three main engines and serves as the structural backbone of the vehicle, absorbing four million pounds of thrust. After main engine cut-off, the tank separates from the shuttle and falls back into the Earth's atmosphere, disintegrating harmlessly over the ocean.

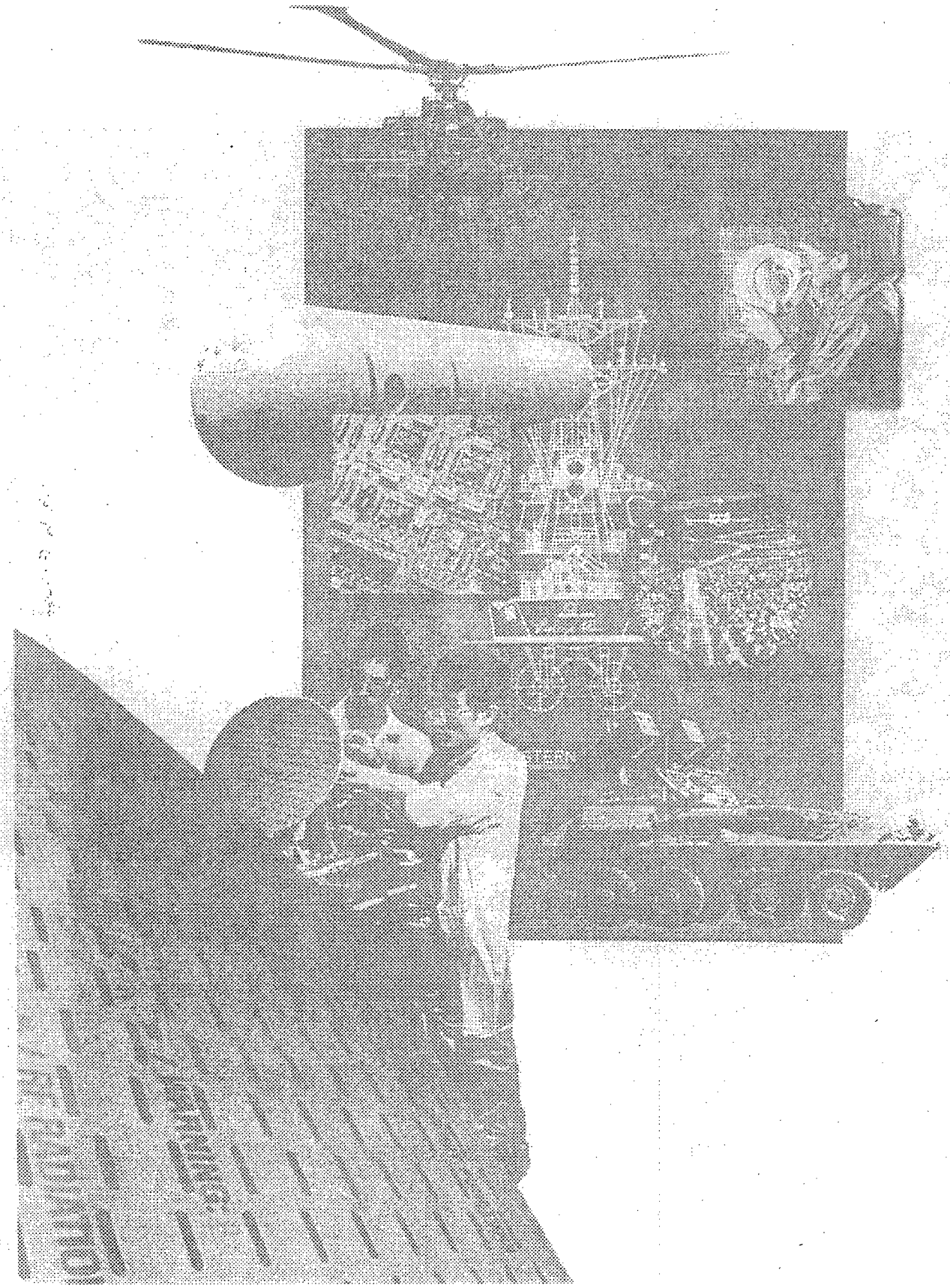
Among major innovations under study by Manned Space Systems for NASA are new super-lightweight external tanks and, through a Technology Reinvestment Project, the development of hybrid propulsion technology that will use both cast solid fuel and cryogenic liquid oxidizer in a single mission.



Tracy Cunningham, left, and Tom Crowley, right, of Martin Marietta Astro Space, inspect an external fuel tank at the Michoud Assembly Facility, Michoud, Louisiana. Tanks, such as the one in the Transfer Orbit Stage, which provides additional propulsion to satellites after they are released from the Space Shuttle, are produced at Michoud.

with the GEO, the first A2100 is due to be launched in 1996 for GE Americom. Astro Space also continues to develop the remote sensing system Landsat 7 for Earth observation.

The failures of the Mars Observer, NOAA-13 and Landsat 6 spacecraft in 1993 were the subject of analyses by a special Mission Success review team organized by the Corporation. The team's recommendations to strengthen the Mission Success program are being implemented.



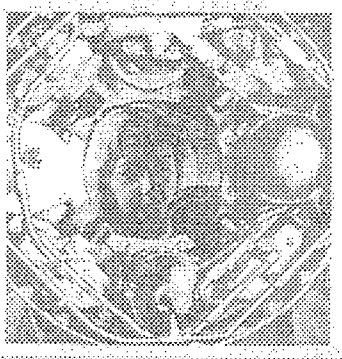
Martin Marietta Electronics Group designs, develops and produces high-performance defense and electronic systems for undersea, shipboard, land-based and airborne applications. Major product lines include advanced-technology missiles; night navigation and targeting systems for aircraft; submarine and surface ship combat systems; airborne, ship- and land-based radar/control systems and thrust reversers for aircraft; ordnance and armament systems; and secure communication systems.

Largest and most diverse of Martin Marietta's groups, Electronics offers opportunities for significant synergies within our traditional defense marketplace, expansion in foreign markets and potential growth in adjacent commercial markets.

Thomas S. Cameron, President, Electronics Group

In 1993, Electronics Group took a number of significant steps to enhance operating efficiency, reduce costs and eliminate capacity in excess of future needs, including a decision to close two regional manufacturing facilities and combine similar product operations from several sites. These actions will eliminate nearly three million square feet of facility space.

Electronics Group, clockwise from top left: Apache helicopter with TADS/PNVS targeting and night vision system; inspection of MGUS signal processor; LANTIRN navigation/targeting system, which image fuses on light emitted while AN/APG-67 airborne radar; on all board fire power and bore measurement system; Mobile Codrom System Test Laboratory; Center-Mitted blueprint for Sidewinder; MGUS testing.



Technicians for quality assurance, Orlando, Fla., perform an inspection of a Longbow component, the fire control assembly.

Electronics & Missiles

The Hellfire II program transitioned from development to production in May with an Army award to build 3,905 units. Hellfire II, a laser-guided missile, features an improved dual warhead and greater resistance to countermeasures and will be carried by the Army Apache and the Marine Corps Super Cobra helicopters. International interest in Hellfire II for air, surface and naval launch platforms is growing.

Javelin, a joint venture with Texas Instruments, Inc., is a man-portable shoulder-launched, "fire-and-forget" weapon capable of defeating all current and projected armor capabilities; it was awarded funding for an initial production phase of up to 700 units. Work continued on Longbow, an integrated fire control radar and "fire-and-forget" missile for the Apache and Comanche helicopters. Longbow development is a joint venture with Westinghouse Electric Corporation.

Martin Marietta delivered its 8,000th Patriot missile in 1993. As principal subcontractor to Raytheon Company, Martin Marietta is responsible for missile bodies, electronic subassemblies and launchers. The Corporation will deliver Patriot missiles and launchers to Saudi Arabia, Kuwait and the U.S. Army under an agreement extending production into 1996.

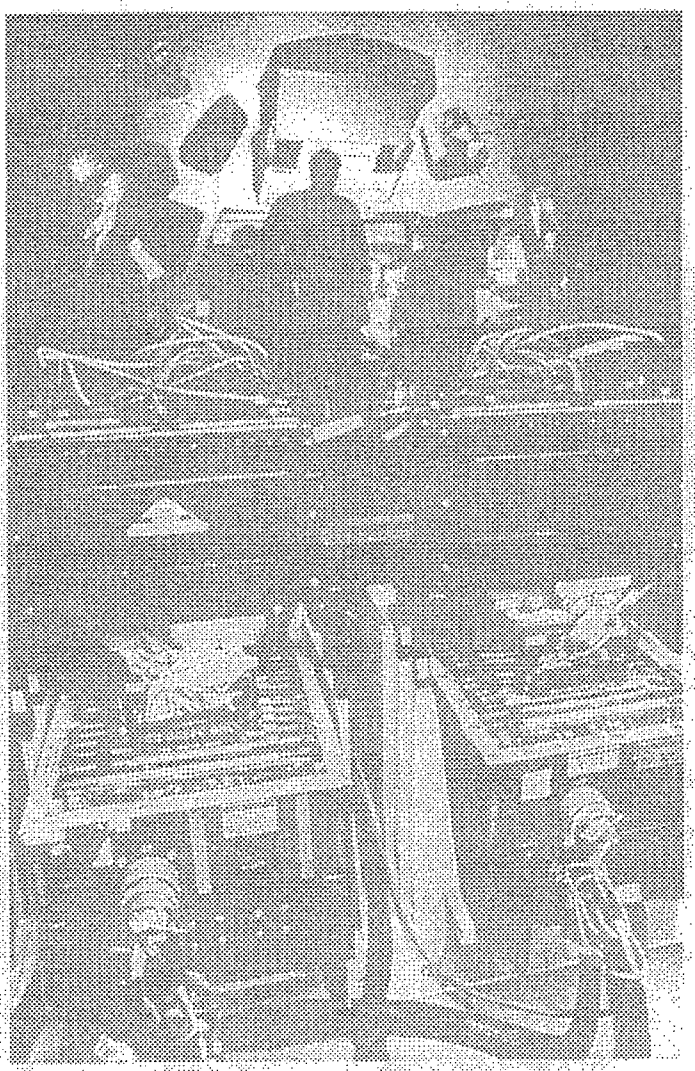
Martin Marietta delivered 60 TADS/PNVS systems in 1993, for a total of 800 units since the program began. TADS/PNVS is a night navigation and targeting system that enables Apache helicopter pilots to fly at very low altitudes in total darkness and poor weather and locate and attack ground targets at standoff distances. Electronics & Missiles has a backlog of 97 TADS/PNVS systems, with additional follow-on orders pending for the Army and a number of international customers.

A total of 261 LANTIRN low-altitude navigation and targeting systems for U.S. Air Force F-15 and F-16 fighter planes was delivered. Orders for 130 systems were received from Greece, Saudi Arabia and Bahrain.

In work for the Air Force and Advanced Research Projects Agency, Martin Marietta is developing a combat system to automatically locate, identify and provide attack information on surface-to-surface missiles while they are still on the ground.

Martin Marietta Ordnance Systems manages the Milan, Tennessee, Army Ammunition Plant, the service's largest facility of its kind. In 1993, the plant produced 12.4 million ordnance items for U.S. military services and government-approved international customers.

The Army's AH-64D Apache helicopter will employ the Longbow fire control radar and missile system. Future Apaches also will carry the Hellfire II anti-armor missile. The Corporation's Orlando site has produced the Apache's more advanced TADS/PNVS night vision and targeting system since 1983.



Engineers at Martin-Marietta Control Systems in Binghamton, New York, use a flight simulator to test flight control systems for the McDonnell Douglas C-17 transport aircraft.

Control Systems

Martin Marietta Control Systems is the leading supplier of fly-by-wire flight controls and engine controls. It also produces integrated controls that combine flight, engine and weapons functions in a single system.

Among new awards were two from Saab-Scania AB of Sweden. Martin Marietta is providing an upgraded flight control computer for Saab's JAS 39 Gripen fighter. The computer receives and processes data from the pilot, and various sensors and directs movement of the plane's control surfaces. It also provides autopilot, autothrottle and airbrake functions. For the new Saab 2000 airliner, Martin Marietta will provide rudder control and powered elevator control units. Over the next 15 years, it is estimated that 400 Saab 2000s will be built.

In another international contract, Martin Marietta was selected by the government of India's Aeronautical Development Establishment to supply the Integrated Flight Control System for that nation's Light Combat Aircraft. The system is expected to include a flight control computer, air data probe, rate and accelerometer systems, and fluid actuators.

For McDonnell Douglas C-17 Globemaster aircraft, Martin Marietta supplies the Electronic Flight Control System, consisting of 11 separate component units. And for the F/A-18 aircraft, during 1998 Martin Marietta delivered 67 sets of flight control electronics and won the contract for engineering and development of the flight control computer for the F/A-18E/F.

Development continued on flight control electronics for the MD-95 aircraft.

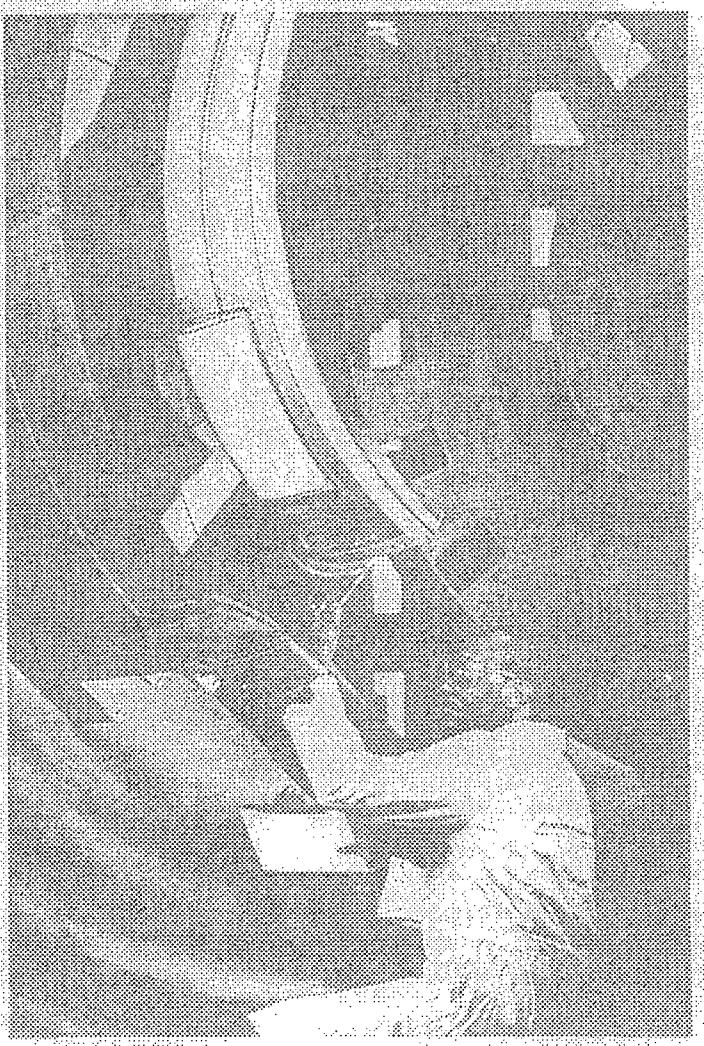
Martin Marietta electronic systems also control GE commercial jet engines. The CF6-80 which will power the Boeing 777 jetliner, and the GE F414, destined for the Navy's F/A-18E/F, are operated by the Full Authority Digital Electronic Control, or FADEC, designed and produced by Martin Marietta. FADEC also is in successful service on the Airbus A320, Boeing 747 and 767 and McDonnell Douglas MD-11.

More than 10 million hours of service with a strong safety record have been achieved by FADEC. Second-generation FADEC IIs are in place on the GE CFM56-5C engines that power the Airbus A340 and the GE CFE-500B1, installed on the Airbus A330, both of which entered service in 1993.

Moving into related markets, the Corporation received two new contracts from GE Transportation Systems, one to provide the Logic Power Supply for GE's electric locomotives and one for an auxiliary blower system for GE's off-highway vehicles.

Commercial opportunities also are being developed in the automotive sector, where Martin Marietta is supplying power-steering systems for electric vehicles being produced by Chrysler Corporation. Other products in development are traction motor controls and auxiliary power converters.

In response to the need to reduce the use of ozone-depleting chemicals in the electronics industry, Martin Marietta has developed a new, benchtop-size, low-cost cleaning system — JetClean® — for circuit boards and other small electronic components. Using low-cost alcohol instead of more costly ozone-depleting chemicals, JetClean has been purchased by 46 electronics manufacturers.



Aero & Naval Systems

The first of four Vertical Launching Systems (VLS) capable of firing the Seasparrow anti-air missile was delivered to the Federal Republic of Germany and installed aboard the frigate *Brandenburg*. Vertical Launching Systems are primary missile batteries for surface ships. The first of 30 additional Seasparrow-capable launchers has been completed and awaits shipment to the Australia-New Zealand (ANZAC) defense alliance. Launch systems also were delivered to Japan for its second Kongo-class AEGIS destroyer, *Atirokina*. The first two VLS-equipped Canadian Tribal-class destroyers, *Algonquin* and *Iroquois*, successfully launched surface-to-air missiles during sea trials this year. Contracts to supply the VLS for an additional five Arleigh Burke- and Spruance-class destroyers and the first of Japan's new DD 229-class destroyers also were awarded.

Martin Marietta's technology in thrust reverses, the devices that help slow jet aircraft upon landing, places the company at the forefront of this $1-billion-a-year global market.

Under terms of a contract modification, Martin Marietta will be the sole source for thrust reversers for GE's CF6 jet engines, more than doubling sales and extending production into the next century. The contract also expands Martin Marietta's role in spares and product support.

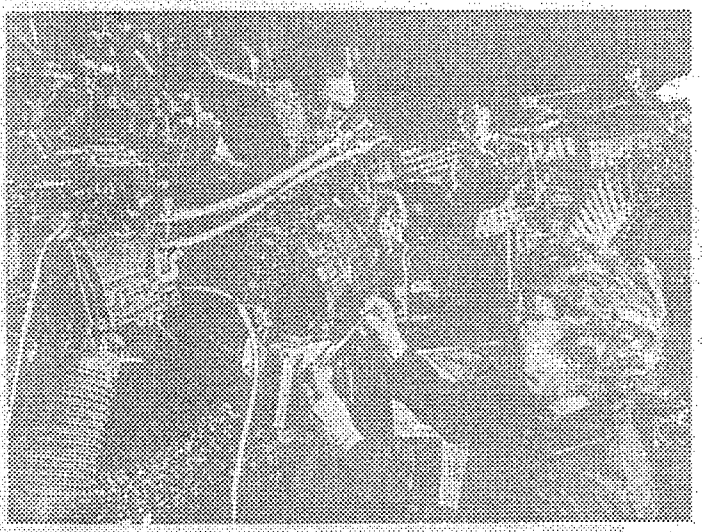
The Corporation delivered four thrust reversers to Pratt & Whitney for its PW4168 jet engine for Federal Aviation Administration flight certification tests. This engine will power the new Airbus Industrie A330.

Continuing its leadership position in the development and production of sonar arrays to detect ships and submarines, Martin Marietta received its first production award for TB-29 thin-line towed arrays and eight receivers and associated support equipment, with options for additional equipment that would extend the contract through 1999. The TB-29 is the primary towed sonar array for the Navy's new Seawolf-class attack submarine and will be retrofitted on Los Angeles-class attack submarines and Ohio-class ballistic missile submarines.

Martin Marietta delivered three Wide Aperture Array advanced cardioid sonar systems to the Navy. These listening devices are mounted on the hulls of Los Angeles- and Seawolf-class attack submarines. Martin Marietta also successfully tested the first two Light Weight Planar Arrays, incorporating composite technologies that provide substantial weight savings for future attack submarines.

Martin Marietta delivered seven tail cones and rudder fairings for Air Force C-17 Globemaster III transport aircraft and continued additional work on Navy Trident II D-5 missiles.

From left, John Dana Stephens, D. Dickson, Gary O. Dunn and Lionel T. Fritz assemble a Gatling gun pylon for the Air Force F-15 fighter aircraft at Armament Systems in Burlington, Vermont.



Communications Systems

Martin Marietta Communications Systems develops and produces communications systems and support equipment for air, space, land, sea and undersea applications and specializes in high-volume production of secure voice and data communications equipment for government and commercial customers.

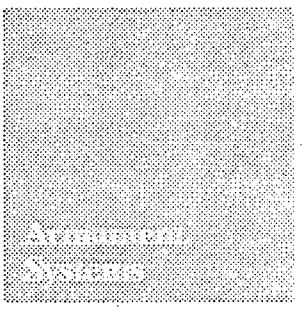
In 1993, Martin Marietta was awarded a follow-on contract for the Improved Remote Monitored Battlefield Sensor System, a lightweight version of the proven REMBASS, which employs remotely monitored sensors placed along likely approaches to detect and classify human or vehicular intruders, providing vital intelligence for special operations forces.

The Corporation has pioneered the development of advanced automated and integrated communications systems for naval platforms. A follow-on contract was awarded for the Integrated Radio Room, the automated external communications suite for the Ohio-class ballistic missile submarine, providing reliable communication with satellites, aircraft, shore facilities and other ships.

As a subcontractor to McDonnell Douglas, Martin Marietta is designing three communications subsystems for the Space Station. These systems will control all of the station's radio communications and external video.

The Corporation produces both product and systems solutions for data capture, storage, transfer and uninterrupted communications and is currently developing storage systems for the medical market.

Also in early fall, the Strategic/Tactical Optical Disk System, a high-performance data storage and retrieval system being developed for the Air Force, operated successfully during flight readiness tests.



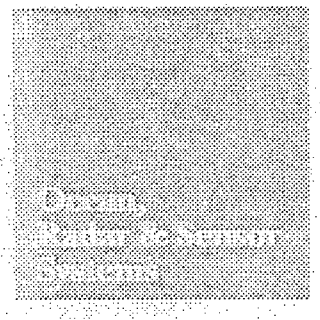
Armament Systems

Martin Marietta Armament Systems' broad product base includes Gatling guns and ammunition handling systems for air, land and sea. Turrets for helicopters, including the Army Comanche, and other sea and air defense applications, round out the production base of more than 50 domestic and international programs. Martin Marietta also has begun development of the next generation high-rate-of-fire gun.

After three years of development, the Corporation completed work on the Blazer air defense turret for the Marine Corps' Light Armored Vehicle Air Defense system. The Blazer turret fires both a 25mm Gatling gun and the Stinger surface-to-air missile. Managed by an advanced fire control system also developed by Armament Systems, the Blazer will protect rapid deployment forces against a variety of close-in air and surface threats.

Martin Marietta is teamed with FMC to develop the Army's new Advanced Field Artillery System and the Future Armored Resupply Vehicle. The Corporation leads the industry in applying advanced technology to the automation of storage, transport and uploading of ammunition for artillery systems.

The year also brought an important development in a potential adjacent market when a consortium led by Armament Systems received a grant from the Technology Reinvestment Project. The grant will fund further development of a mobile electric generator, powered by the same rotary engine technology that Martin Marietta is developing for use in unmanned aerial vehicles. Both products have potential military and commercial applications.



Martin Marietta Ocean, Radar & Sensor Systems develops and manufactures submarine and surface ship coupling and torpedo defense systems as well as radar, surveillance and avionic systems.

Full-scale development continued for the AN/BSY-2 Combat System for the Seawolf-class attack submarine. BSY-2 is the Navy's first fully integrated submarine combat system, featuring information processing, operator displays and controls for weapons systems and several major acoustic systems, including the Wide Aperture Array. The team also won a contract to develop combat systems concepts for the Navy's new attack submarine, the follow-on to the Seawolf, positioning Martin Marietta as a leading contender for full system development.

Martin Marietta is the sole-source supplier of the Navy's Surface Ship Torpedo Defense program, developing a major combat system that will employ cost-saving, off-the-shelf hardware. The group is teaming an international consortium competing for full-scale development of the joint U.S./United Kingdom program.

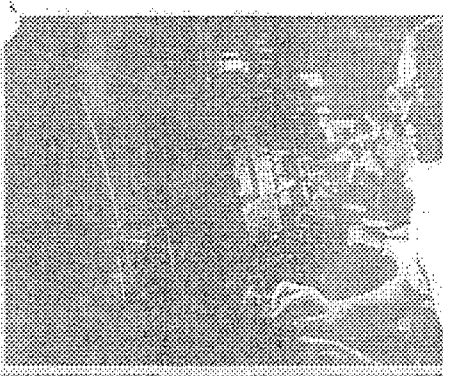
Demonstrating its rapid response capability, Martin Marietta shipped a ground-based radar system, the FPS-117, to Kuwait in September, within 90 days of contract award. The FPS-117 is a solid-state, minimally attended, three-dimensional radar that provides long-range surveillance for air defense and air traffic control.

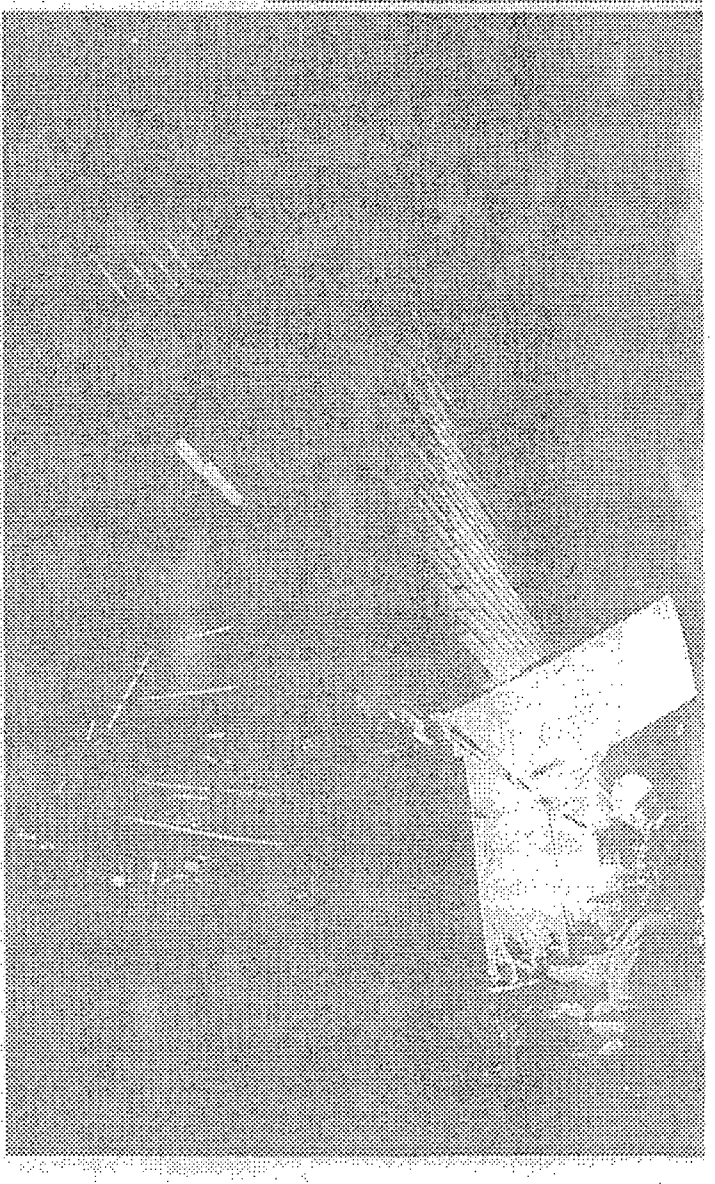
The Marine Corps expanded the scope of its AN/TPS-59 Upgrade Program, beginning the modification of mobile ground-based radar to include tactical ballistic missile defense. More than 100 Martin Marietta ground-based radar systems are in production or operation for more than a dozen nations.

Martin Marietta won a Navy contract for initial development of the next generation AP-series airborne early-warning radar while continuing airborne early-warning radar projects for international customers including Egypt, Israel, Japan, Singapore and Taiwan.

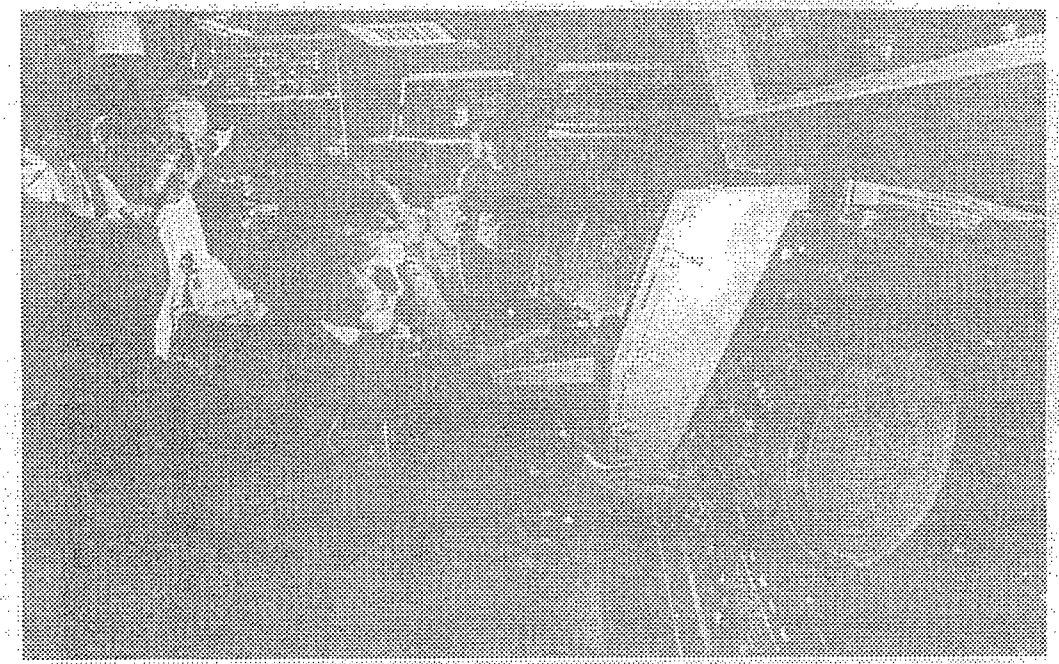
A joint technical team from Martin Marietta and the Republic of China's (Taiwan) Aero Industry Development Center is cooperating on co-assembly of an advanced airborne radar system, the multi-mode APG-67, for Taiwan's new indigenous Defensive Fighter. This compact, lightweight radar is a prime candidate for upgrading the avionics on military aircraft worldwide; derivative versions are being marketed in several other countries.

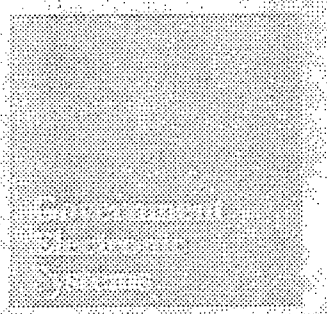
Martin Marietta is teamed with Sanders Associates, a Lockheed subsidiary, to develop the electronic warfare system for the F-22 and successfully completed preliminary design reviews in 1993.





Navy and Martin Marietta technicians check an AEGIS combat system at Moorestown, New Jersey, home to the "shield of the fleet." AEGIS is favorite surface ships from theater to task.





Martin Marietta was prime contractor to the Navy for AEGIS, the world's most advanced surface ship combat system. AEGIS is capable of automatically and simultaneously detecting, tracking and engaging hundreds of aircraft and missiles.

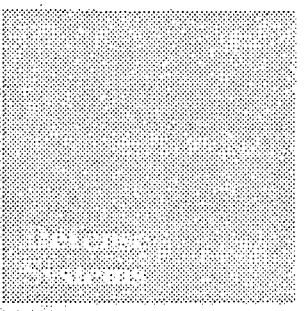
In 1992, the final AEGIS combat system was installed aboard the *Port Royal*, successfully completing the Ticonderoga-class cruiser program. At the same time, the AEGIS destroyer program expanded and Martin Marietta was awarded a contract with the Navy to provide 20 combat systems for Arleigh Burke-class destroyers through 1997.

The heart of the AEGIS system, the AN/SPY-1 phased array radar, was produced by Government Electronic Systems at Moorestown, New Jersey.

The AEGIS program won a fourth contract for a destroyer for the Japanese Maritime Self-Defense Force. The first Japanese AEGIS destroyer, *Atago*, was commissioned in March. The Corporation is also upgrading ships already in service, adding new features that include shipboard tactical ballistic missile defense.

In September, Martin Marietta delivered the first active electronically scanned array antenna, the antenna for an enhancement to the SPQ-9B horizon search radar system, which is designed to locate hostile mortar, artillery and rocket launches rapidly and accurately under adverse battlefield conditions. COBRA is being developed jointly by a multinational team comprising Martin Marietta Systems, Germany; Thorn EMI, United Kingdom; and Thomson-CSF, France.

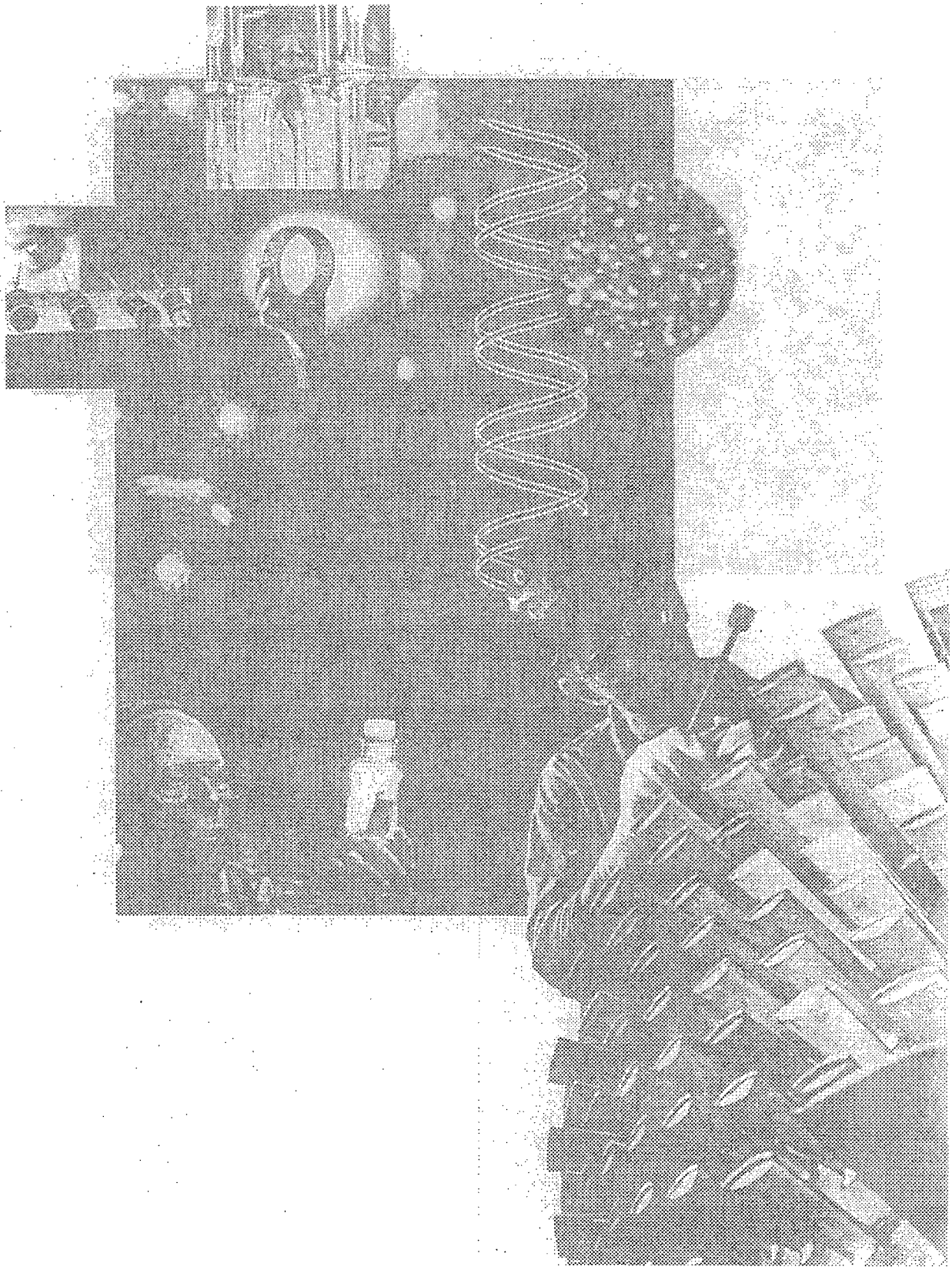
Martin Marietta also won a contract from the Technology Reinvestment Project to build and demonstrate an advanced phased-array radar for commercial aviation. The technology will be applied to air traffic control and weather surveillance operations.



During 1992, the Army awarded Martin Marietta a contract to further develop liquid propellant advanced technology for artillery. The Corporation successfully tested the new artillery system, firing the liquid propellant gun in a fully automated three-round burst. The event signaled a critical achievement in the continuing development of a second-generation LP gun system.

In March 1993, the Army awarded Defense Systems a contract for Land Combat Depot Support. In this initial entry into the land combat vehicle after-market business, the Corporation will overhaul transmissions for the Army's Bradley fighting vehicle.

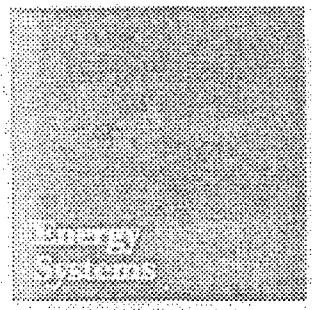
The Corporation also won a Navy contract to produce 30 MK6 Inertial Measurement Units for the Trident II missile and delivered the final Phalanx Close-In Weapon System to the Navy eight months ahead of schedule.



Martin Marietta Energy Group's command of technologies, information management and materials places it at the leading edge of developments affecting the production of energy, environmental clean-up, manufacturing technology and laboratory research. Headquartered in Oak Ridge, Tennessee, the Group comprises Martin Marietta Energy Systems, which manages three major Department of Energy facilities in Oak Ridge; Martin Marietta Specialty Components, manager of the Department of Energy's Pinellas Plant in Largo, Florida; and Martin Marietta Utility Services, manager of the Department of Energy enrichment plants in Kentucky and Ohio that are currently leased by the United States Enrichment Corporation. Successful management of these diverse facilities is leading to additional opportunities for increasing public-private sector cooperation, technology transfer and product development.

Oak Ridge National Laboratory

Energy Group, combining gives top left, increasing environmental imaging tool magnified in array microprobe provides diffusion furnace, genetic research, ceramics undergoing heat treatment, Graphite Corporation, light absorbing superfine carbon powder, model and double helix of deoxyribonucleic acid (DNA).



Martin Marietta Energy Systems is managing contractor for Department of Energy research and development, manufacturing technology and environmental management operations in three states. A key national need is being addressed at Oak Ridge, Tennessee, where conceptual design for the Advanced Neutron Source (ANS) was completed in 1993. When the ANS enters operation early in the 21st century, thousands of researchers from universities, laboratories and industries around the world will be able to use the facility to probe materials to determine their atomic structure. This research could lead to stronger metals, advanced plastics and breakthroughs in understanding biological structures, including deoxyribonucleic acid (DNA), the basic building block of living systems.

Energy Systems increased its emphasis on working with American industry by providing access to nearly 50 years accumulated expertise in advanced materials and ceramics, robotics, instrumentation and control technologies, environmental protection and waste management and high-precision manufacturing.

An example of this program occurred in response to the Clinton Administration's call for a "clean car." Oak Ridge experts in high-temperature, lightweight materials and technologies involving alternative fuels are now applying their knowledge to lowering the cost of the manufacturing process for engines. The use of advanced ceramics for internal combustion engines should improve the durability and efficiency of automobiles of the future.

The Oak Ridge Centers for Defense and Manufacturing Technology at Y-12 also operate technology transfer programs to help small businesses solve technical problems through use of the Centers' expertise in materials science, measurement science and state-of-the-art manufacturing processes.

Energy Systems manages an extensive environmental restoration and waste management program at five Department of Energy sites.

The new Oak Ridge Center for Environmental Technology is working with the private sector, academia and government to accelerate the development, demonstration

At the Buildings Technology Center in Oak Ridge National Laboratory, Philip B. Childs conducts research on the performance and energy efficiency of diverse roofing materials under a variety of simulated weather conditions.

and commercialization of environmental technologies — the vital steps necessary to reduce escalating costs incurred in cleanup of hazardous waste sites, treatment and disposal of toxic waste and other forms of waste management and environmental protection.

In 1992, the Oak Ridge technology transfer program helped establish 56 Cooperative Research and Development Agreements and granted 21 licenses to industrial firms for use of technologies developed as part of the nation's defense program.

Specialty Components

Since June 1982, Specialty Components has been the management and operating contractor for the Department of Energy's Pinellas Plant in Largo, Florida, which for 38 years has supplied electronic components to national defense arsenals. With production at the plant scheduled to end in late 1994, Specialty Components is taking steps to reposition the business and its employees for commercial opportunities within the private sector.

The Pinellas facility also has begun this partnership with Energy Systems at Oak Ridge, the state of Florida and the Department of Energy to create a Cooperative Research and Development Agreement that opens the Pinellas Plant's doors to Florida companies that wish to draw upon the facility's technology, capabilities and expertise.

Machine for military systems now inspected for Mr. Lee Mullinax, Operation Manager, Specialty Components, Inc., by Energy Systems engineer Jack G. Couch. As part of the technology transfer program, Oak Ridge is helping Pinellas industry solve complex quality problems and improve the last processes.

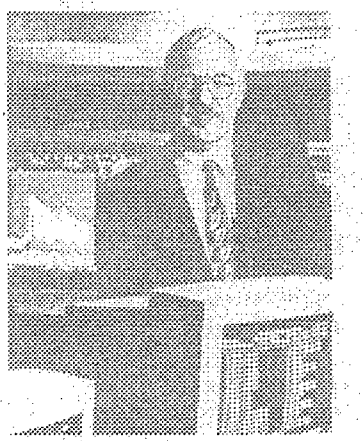
Utility Services

Martin Marietta Utility Services was organized to support the U.S. Enrichment Corporation, a newly created government corporation that manages the enrichment of uranium fuel for sale to nuclear power plants throughout the world. Martin Marietta worked with the Department of Energy and the Enrichment Corporation to assure a smooth transition of responsibilities and management from the Department of Energy to the new company.

Uranium enrichment production continued at the Paducah, Kentucky, and Portsmouth, Ohio, Gaseous Diffusion Plants, providing enrichment services to 61 electric utilities in 11 countries and generating $1.8 billion in revenues for the U.S. Treasury.

Martin Marietta Information Group designs, develops, integrates and operates information systems and simulation and automated test systems for government and commercial customers. The Group is headquartered in Bethesda, Maryland.

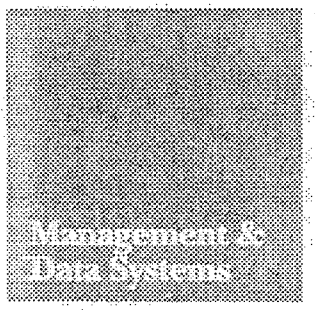
Information Group is a major participant in the global information technology marketplace. Sales are increasing in Asia and the Middle East, and in domestic markets, particularly to civil government where modernization of information systems in such areas as law enforcement, health care and services is on the rise. The Group also is expanding into related commercial markets, providing products and consulting services.



Peter A. Brooker
President
Information Group

In 1995, to reduce operating costs, the Group began collocating Automation Systems and portions of Information Systems and Internal Information Systems in Orlando. Internal Information Systems is consolidating processing centers and upgrading voice communications across the Corporation, increasing productivity and realizing significant savings.

In Fairmontown Circle, Indiana, Gary Jeffers (left) and Jerry Ford (right) employed Orlando Automation expertise to install fiber optic cable and other wiring. Jerry Ford is a member of Local 1 Union. Ford is a member of the Local Union, Gary Jeffers is a member of the Local Union. Jerry Ford is a member of the Local Union, Gary Jeffers is a member of the Local Union.



Martin Marietta Management & Data Systems provides command and control systems and information processing services to the Department of Defense, NASA, the intelligence community, the Federal Aviation Administration and commercial customers. By leveraging its strengths in systems engineering and integration, program management and software development, the Corporation has successfully pursued closely related markets requiring technically advanced, information processing system solutions.

Martin Marietta is developing a worldwide distributed information management system for the federal government for installation at 94 sites with over 800 users. The Corporation also was awarded a long-term contract to redesign a satellite support system. Management & Data Systems, a leader in object-oriented software design, has over 20 years experience with the system and is developing a state-of-the-art distributed computer system to modernize the entire network.

In 1993, Management & Data Systems, teamed with Services Group, won the Federal Aviation Administration's (FAA) National Airspace System implementation support contract to provide field support services to help integrate new equipment into the existing air traffic control system. Under a separate contract, Martin Marietta continues as the FAA's largest systems integration contractor in its program to modernize the nation's airspace management system. As part of this ongoing contract, the Corporation is helping to integrate the efforts of more than 50 major contractors. Martin Marietta continues to pursue work with other transportation systems such as highways, rail, water and international airspace systems.

With significant contracts from the International Maritime Satellite Organization, Motorola and the Public Broadcasting Service, Martin Marietta has established itself as a commercial ground systems contractor for communications satellites.

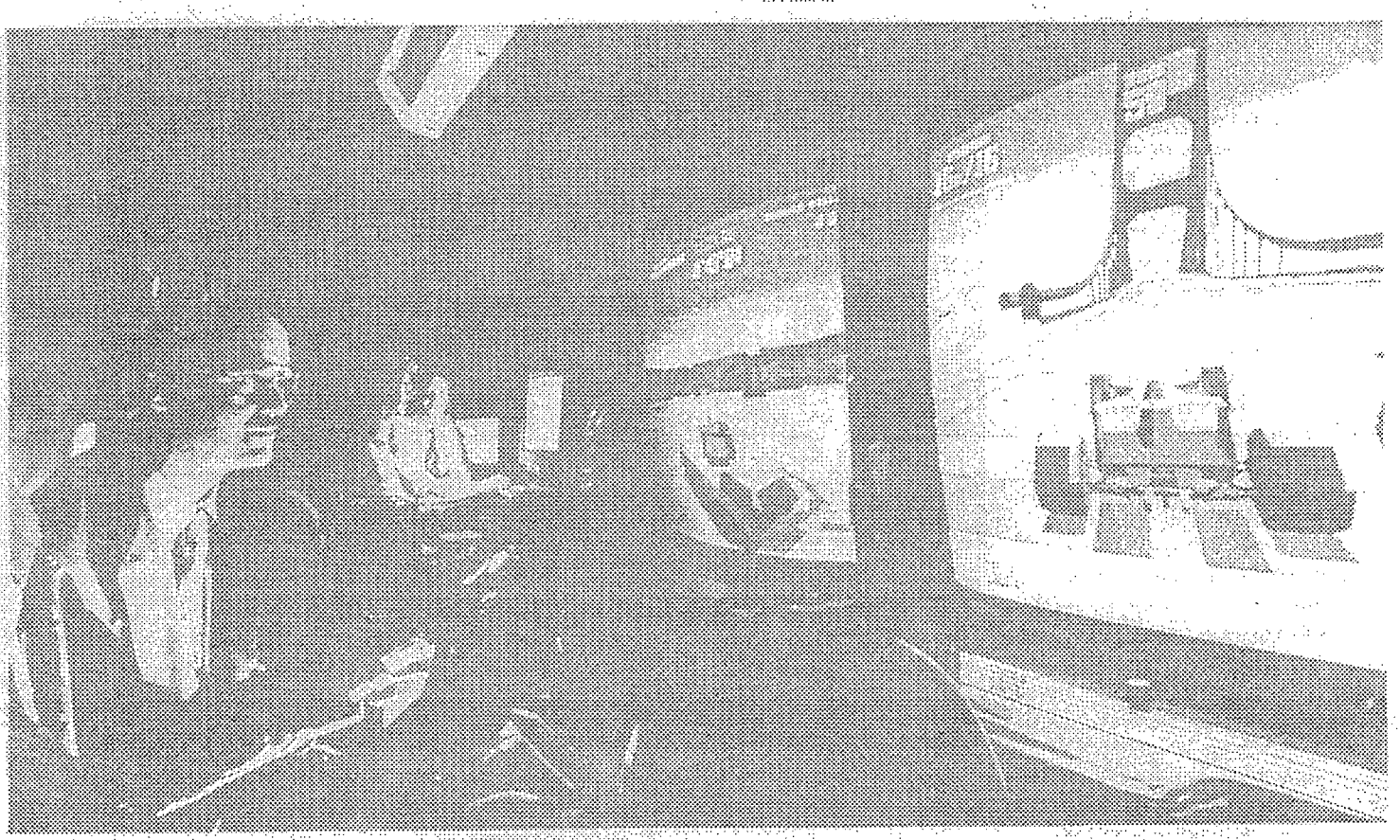
The Corporation also is building a turnkey satellite command and control ground system in support of Orion Satellite Corporation's first communications satellite, expected to be launched in 1994.

In a cooperative effort between Strategic Systems in Valley Forge, Pennsylvania, and Astronautics in Denver, Martin Marietta won the Ballistic Missile Defense Options Assessment Contract that will demonstrate innovative software development techniques for application to the Ballistic Missile Defense system. The program aims to improve battle management command, control and communications.

Also in the ground systems arena, and working with Martin Marietta Astro Space, Management & Data Systems is designing, developing and integrating software for flight operations and information processing for the Department of Defense Landsat 7 program. The Corporation also pro-

Steve P. Nolte and Edgar L. Richardson develop a prototype for the Integrated Solutions Center. Located in Denver, Colorado, the Center combines fully equipped, state-of-the-art participating laboratories with a broader quality demonstration capability that prompts rule interactions.

Lockheed Martin Information Systems and Services, originally developed for defense applications, is now for use in the entire business industry by employees, management teams, Henry J. Wise, Erika S. Dyke, Lisa H. Spence and Lionel S. Levinson.



vides information technology products and services to commercial customers worldwide, including training and software tools, design and development of processing systems, systems integration services and re-engineering of business processes and systems. Federal Express and GE Capital are among the Corporation's customers.

Information Systems

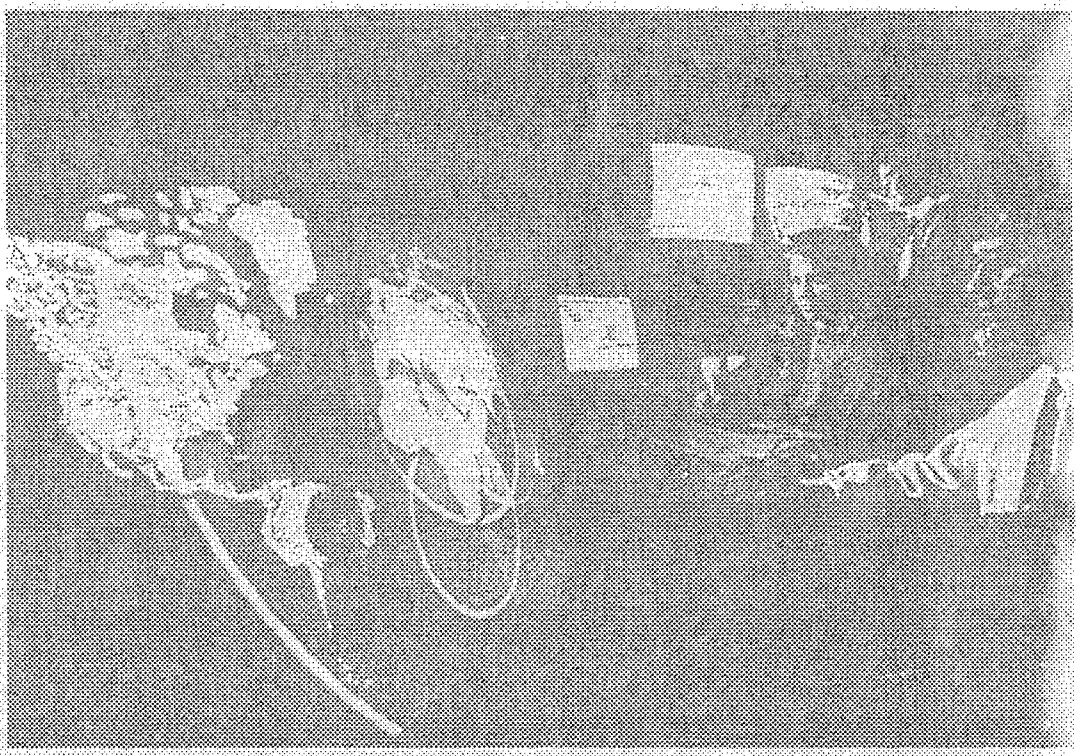
Martin Marietta Information Systems provides information management products and services for civil government, military and commercial customers. Its business areas include development of computer-based simulation and training systems and systems integration and modernization.

In 1993, Martin Marietta completed development of the new information system for the federal Department of Housing and Urban Development, linking the HUD computer center with its disaster-recovery facility, headquarters and all 81 regional and field offices, thereby facilitating the agency's customer responsiveness. The Corporation is in the third year of this 12-year contract.

Information Systems added a number of new clients for its information processing services, including ProSource Distribution Services, JP Foodservice and INFONET.

Martin Marietta also began implementing the Accounting Database for the Evaluation of Performance Trends for the Department of the Treasury. This general ledger system permits the agency to generate financial statements

From left: Lyle A. Sampels, Robert D. Sanphaier and Arthur A. Arms using a portable image intensifier at the National Test Facility in Colorado, operated by Martin Marietta for the Air Force Space Command and the Ballistic Missile Defense Organization.



similar to those in private industry.

Work continued for the Department of Justice and the Immigration and Naturalization Service to expand the scope of the Systematic Alien Verification of Entitlement program, which will give private industry on-line access for verifying alien resident registration and citizenship status. Martin Marietta will expand the pilot program in 1994.

The Department of Labor used the Corporation's professional services and data processing support to expand its UI Internet System, allowing each state access to information on unemployment benefit claims. Martin Marietta also contributes its work for the Department of Agriculture, whose search collects and analyzes agricultural information from the national headquarters and 45 state statistical offices.

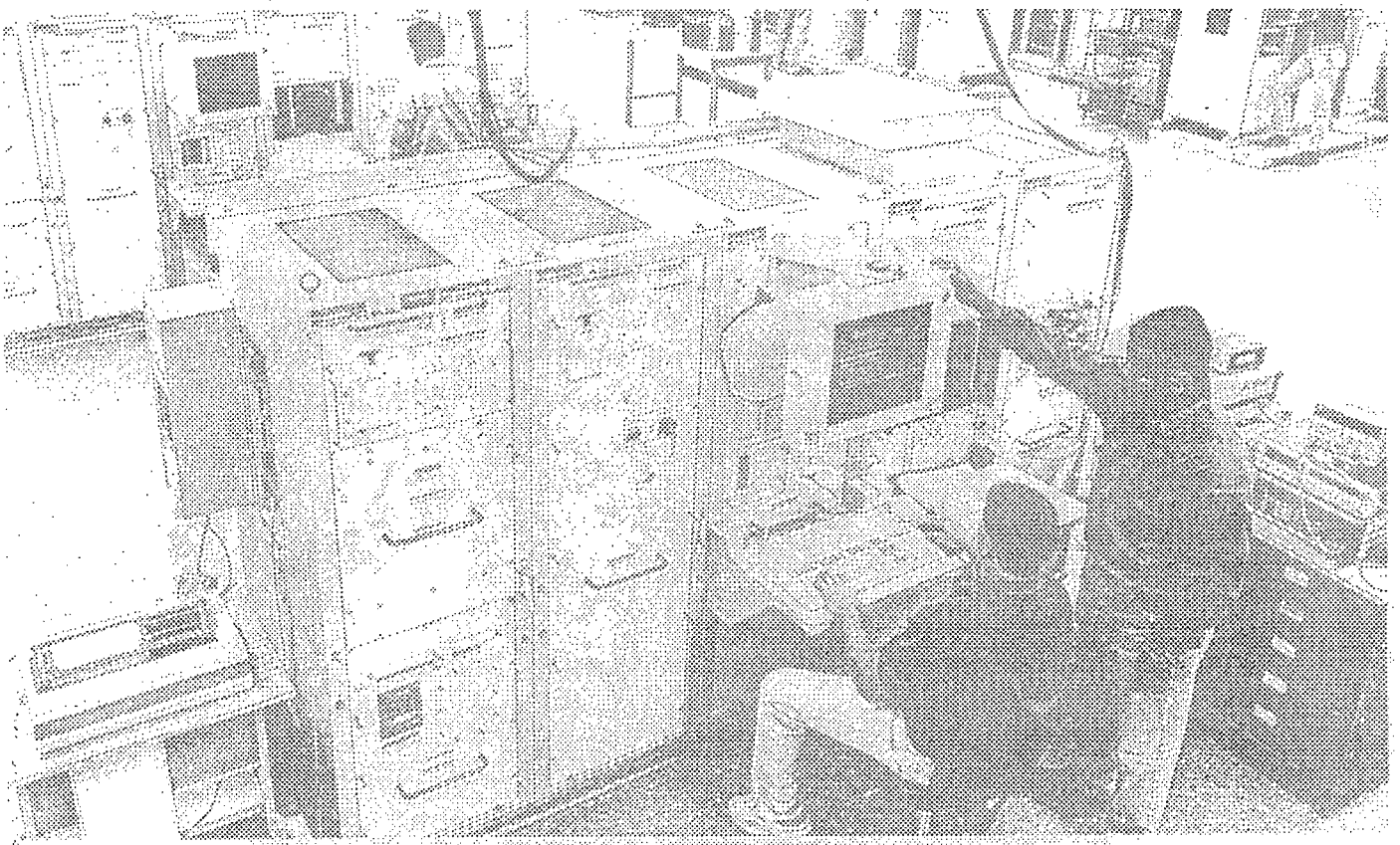
Martin Marietta is the prime contractor for the National Test Facility, a complex supercomputing and simulation resource used to support strategic and theater defense planning. Under direction of the Air Force, the Test Facility was linked to the Martin Marietta-operated Theater Air Command and Control Simulation Facility at Kirtland Air Force Base, New Mexico, providing support for testing theater missile defense concepts. The Test Facility also was connected to the Advanced Research Projects Agency's Distributed Simulation Internet, bringing the simulation resource program nationwide.

Key to Martin Marietta's simulation success is its family of CompuScene® technology products. CompuScene VI was purchased in 1993 by the Marine Corps for use in helicopter pilot training. Other Martin Marietta image-generator systems are being developed for Navy and Marine Corps fixed-wing, helicopter and deck-based aircraft training.

In 1993, Martin Marietta was awarded contracts to provide army-training services in the Middle East and Europe, including crew gunnery simulators and driver trainers for M1A1, M48 and Leopard tanks, and state-of-the-art M1A2 Platoon Gunnery Trainers and Tank Driver Trainers. Martin Marietta's Fort Knox, Kentucky, Driver Training Facility features a unique network for consolidating and tracking individual student performance. Platoon Gunnery Trainers are fully networked individual crew stations that can be used for tactical team training or as individual crew trainers.

Martin Marietta delivered 96 full-mission M1 tank training systems to the Army and replicated the integrated commander/gunner display station for the M1A2 main battle tank.

A C[illegible] [illegible] diagnostic system, [illegible] on Daytona beach and assembled at Martin Marietta's Aerospace, Orlando, plant, is tested before shipment to the Navy.



Automation Systems

Martin Marietta Automation Systems provides computer-based automated test control and automated logistics systems for civil government, military and commercial clients.

In 1988, the Consolidated Automated Support System (CASS) successfully completed operational evaluation by the Navy. Currently, Martin Marietta is under contract to provide 250 CASS systems to the Navy.

The Corporation has developed a commercial variant of CASS for factory application, the CASS Integrated Test Equipment, or CITE 3000. In 1988, six CITE and one CASS systems were delivered to the Navy's principal contractor for the joint Stand Off Weapon.

Martin Marietta delivered the Equipment Management System to the Air Force. This inventory management system is designed to track all Air Force equipment, except weapons, consumables and fuel, an aggregate of 3,000 logistics personnel responsible for recording an inventory of approximately 250,000 items. The Air Force system is the forerunner of a computer-based paperless inventory management system for tri-service application.

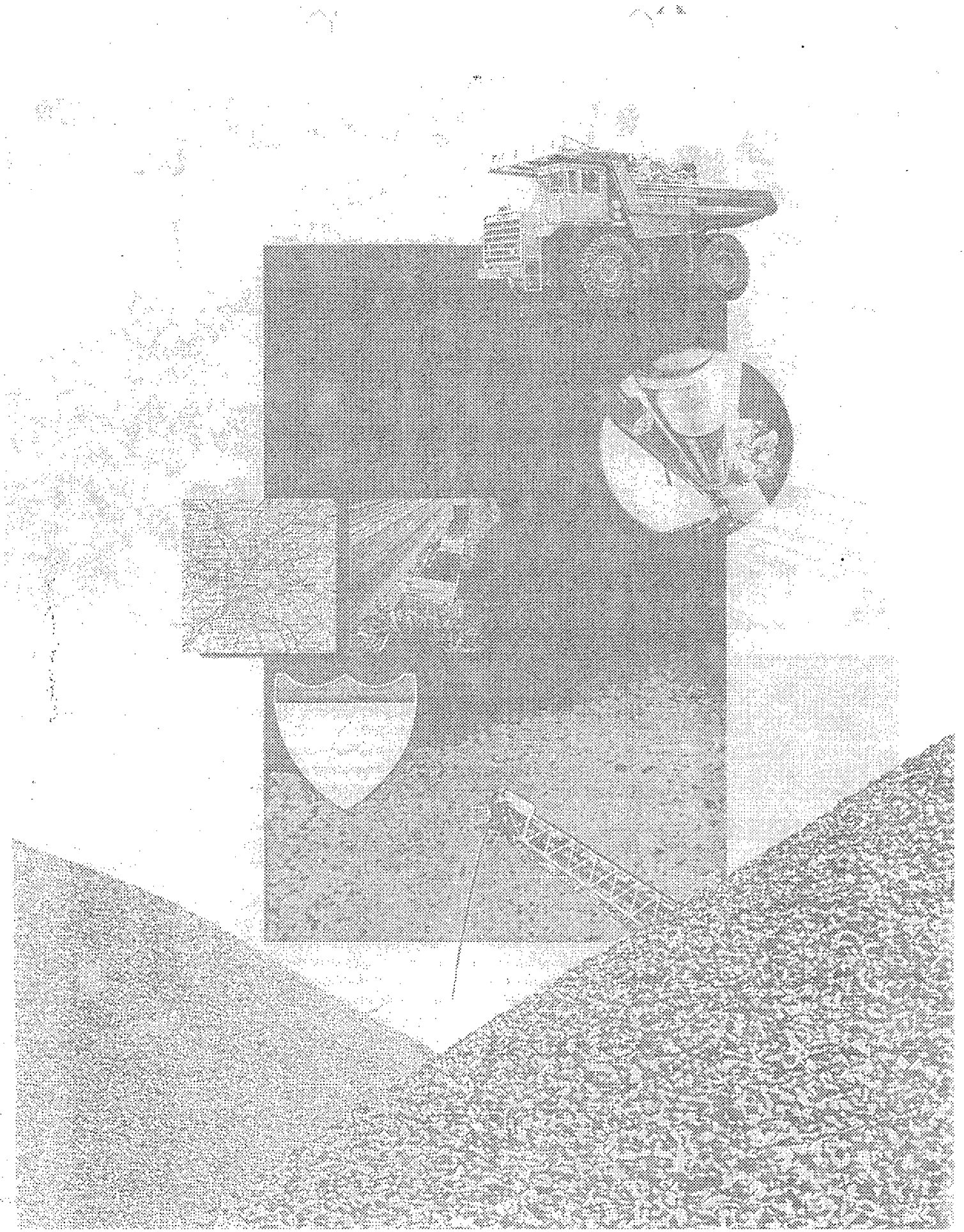
Martin Marietta continues to operate the Air Force LANTIRN low-altitude navigation and targeting system Automated Depot. This integrated software system employs a distributed computer network that virtually eliminates depot paperwork.

Automation Systems also provides automated machinery control systems for military vessels around the world, encompassing seven ship classes for the navies of nine countries. These systems use open-architecture, advanced microprocessor technology for shipboard propulsion control and for remote monitoring and control of key systems.

Martin Marietta also manufactures portable test units for Apache helicopters, Army trucks, Bradley fighting vehicles, M1A1 tanks and HMMWV multi-purpose vehicles. Use of Martin Marietta-built testing equipment has cut troubleshooting time by more than 25%.

In 1988, Automation Systems won a competitive procurement for 900 of the portable test units, bringing the total under contract during the last 15 years to more than 18,000 units.

During the year, Automation Systems also introduced an advanced technology upgrade for gas turbine engine controllers. The first of these controllers will be installed in the Navy's Arleigh Burke-class destroyers.



Late in the year, Martin Marietta Materials, Inc., was established as a wholly-owned subsidiary of Martin Marietta Corporation. Martin Marietta Materials comprises Martin Marietta Aggregates and Martin Marietta Magnesia Specialties, Inc., all headquartered in Raleigh, North Carolina. In December, Martin Marietta Materials filed a registration statement with the Securities and Exchange Commission for an underwritten public offering of its common stock, to be offered initially in the first quarter of 1994. Martin Marietta will retain slightly more than 80% of the new company's outstanding stock.

Martin Marietta Aggregates, which produces crushed stone, sand and gravel for the construction industry, is well-positioned to increase particularly demand generated by infrastructure rebuilding and the recovery in commercial construction. Aggregates increased shipments by 15% in both Mississippi and Southern Indiana construction improved in 1993. At 65 million tons, shipments of crushed stone, sand and gravel reached a record level. Increased funding for highways, along with a resurgence in residential construction, created a significant increase in demand in most market areas.

Aggregates increased its capacity by building three acquisitions during the year. A sand and gravel operation near Omaha, Nebraska, was purchased, as were limestone quarries near Frederick, Maryland and Paris, Illinois. The company completed a major expansion at its underground mine near Indianapolis, Indiana, doubling its finished capacity. A new stone quarry was opened in the high-growth area north of Indianapolis adjacent to the Aggregates' existing River Mills sand and gravel operation.

In the Southeast, Martin Marietta experienced strong growth in Georgia, where Aggregates has built or acquired significant new capacity during the past five years. Rail shipments into Florida from quarries near Macon and Columbus, Georgia, increased sharply. Shipments improved in North Carolina at the major metropolitan areas of Charlotte, Raleigh-Durham and Greensboro, and rail from quarries in Virginia.

In the Midwest, heavy rains and the widespread floods hampered earlier production and quarry operations. Subsequent repairs of flooded facilities created heavy demand in the latter part of the year and are expected to continue well into 1994.

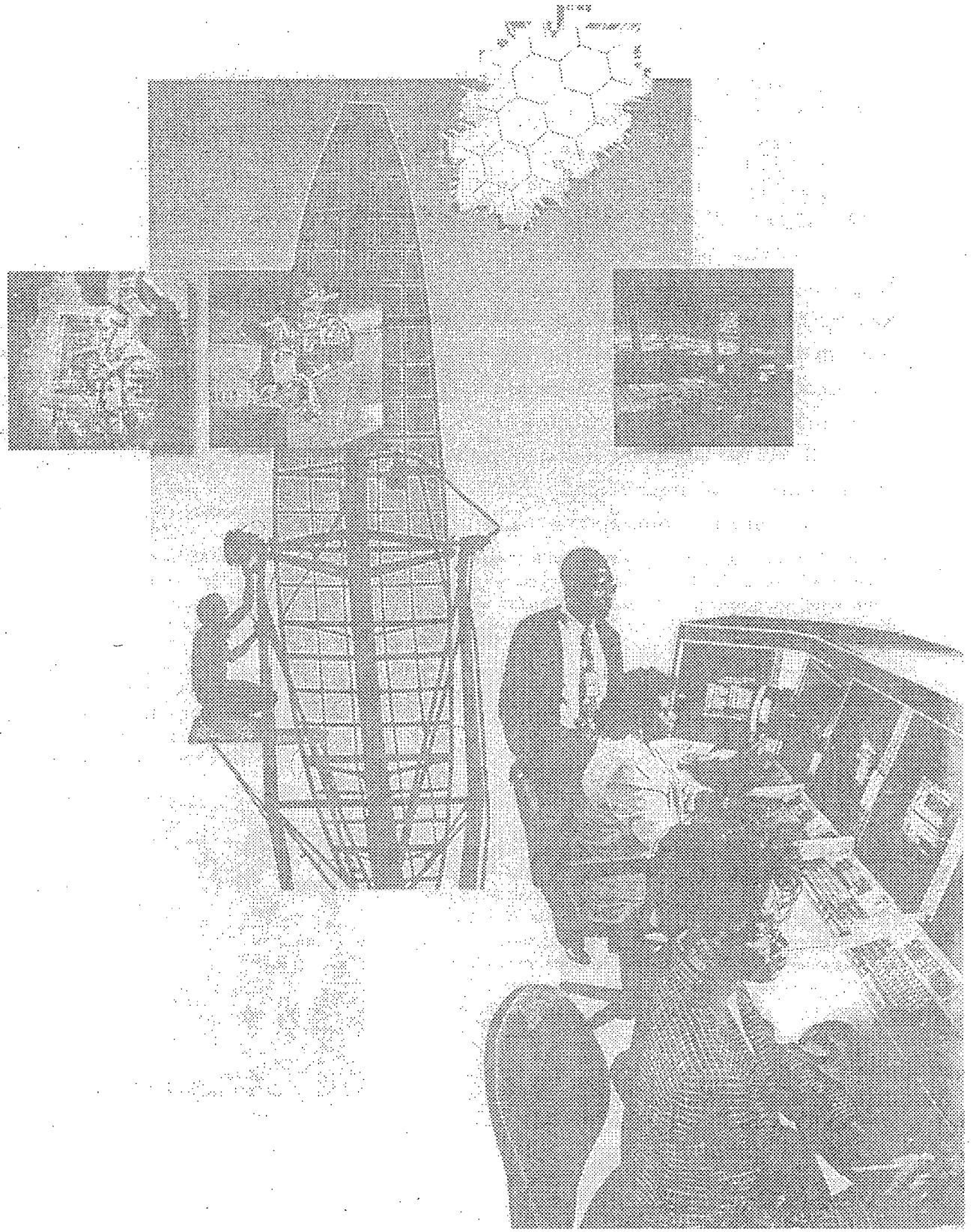
In 1993, Martin Marietta Magnesia Specialties moved forward with its expansion in the wastewater treatment market. A new facility was completed at the Manistee, Michigan, plant to produce FloMag, a product used to neutralize acid wastewater. The product will open new markets for treating wastewater from food processing plants, municipalities, plating shops and dyestuff operations. During the year, the Corporation also received a patent on its granular FloMag product used to remove heavy metals from industrial process effluent.

In the refractory area, Martin Marietta is a leading supplier of refractory products and services used to line furnaces in steel making. In 1993, the Corporation expanded into Mexico while continuing to develop new products in the United States. Martin Marietta began importing natural magnesite from China to reduce cost and to broaden its product line. The combination of low-cost, lower-quality imported material with the Corporation's high-quality magnesite is expected to provide a complete range of products at a competitive cost.

Magnesia Specialties continues to focus on providing high-quality, value-added products to its refractory and chemical customers.

In 1993, the Corporation's refractory products set nine heat-life records in steel mills in the United States. Research and development programs continue to provide new products that meet the special needs of customers.

Stephen P. Zelnak
President
Martin Marietta Materials, Inc.



Martin Marietta Services Group provides technical and management services around the globe for the Department of Defense, NASA and a growing number of civil government agencies. Key to Services Group's success has been the ability to leverage technology resident elsewhere in the Corporation with a more competitive cost structure. Headquartered in Cherry Hill, New Jersey, the Group operates at over 150 locations around the world. The Group also provides management and engineering support to the Department of Energy's Knolls Atomic Power Laboratory in Schenectady, New York.

In 1993, Martin Marietta won a nine-year follow-on contract to support NASA's Life Sciences Directorate at the Johnson Space Center in Houston, Texas. The scope of the program was recently increased to include support for mission integration for man-tended flights between the space shuttle and the Russian Mir spacecraft. As a part of this contract, Martin Marietta Services Group provided substantial support to the October 18, 1995, Spacelab mission dedicated to understanding the effects of weightlessness on human health and productivity. Services Group also designed, built and tested motor systems for the Spartan 201 science satellite that was launched in April.

During the year, Services Group continued to receive high marks from its customers for its support of key Department of Defense facilities, especially for operation of the Atlantic Fleet Weapons Training Facility for the Navy and the Alaskan Radar Warning System for the Air Force. Services Group also helps deploy threat simulators used for training Army units at Fort Bliss, Texas, and other locations and supports Navy AEGIS simulators in a number of locations.

In 1995 the Group won a contract to operate the Hill Air Force Station Range and for range scheduling.

Services also teamed with Martin Marietta Aero & Naval Systems in a contract to provide field support services to the Federal Aviation Administration in implementation of the National Airspace Status, which is designed to significantly upgrade the government's air traffic control system.

The consolidation of GE Government Services into Martin Marietta Technical Services broadened both capabilities and customer base and positioned the Corporation to win contracts to support agencies with modernization of Department of Defense computer automation systems.

Martin Marietta also supports the Social Security Administration in its 10-year computer modernization program. Software developed by the Corporation helped the agency handle payments to more than 250,000 beneficiaries from 850 field offices with an error rate of 0.1 percent during 1995. The Corporation earned a 97% award fee for the late 1995 rating period, its second consecutive rated as "well above highly successful."

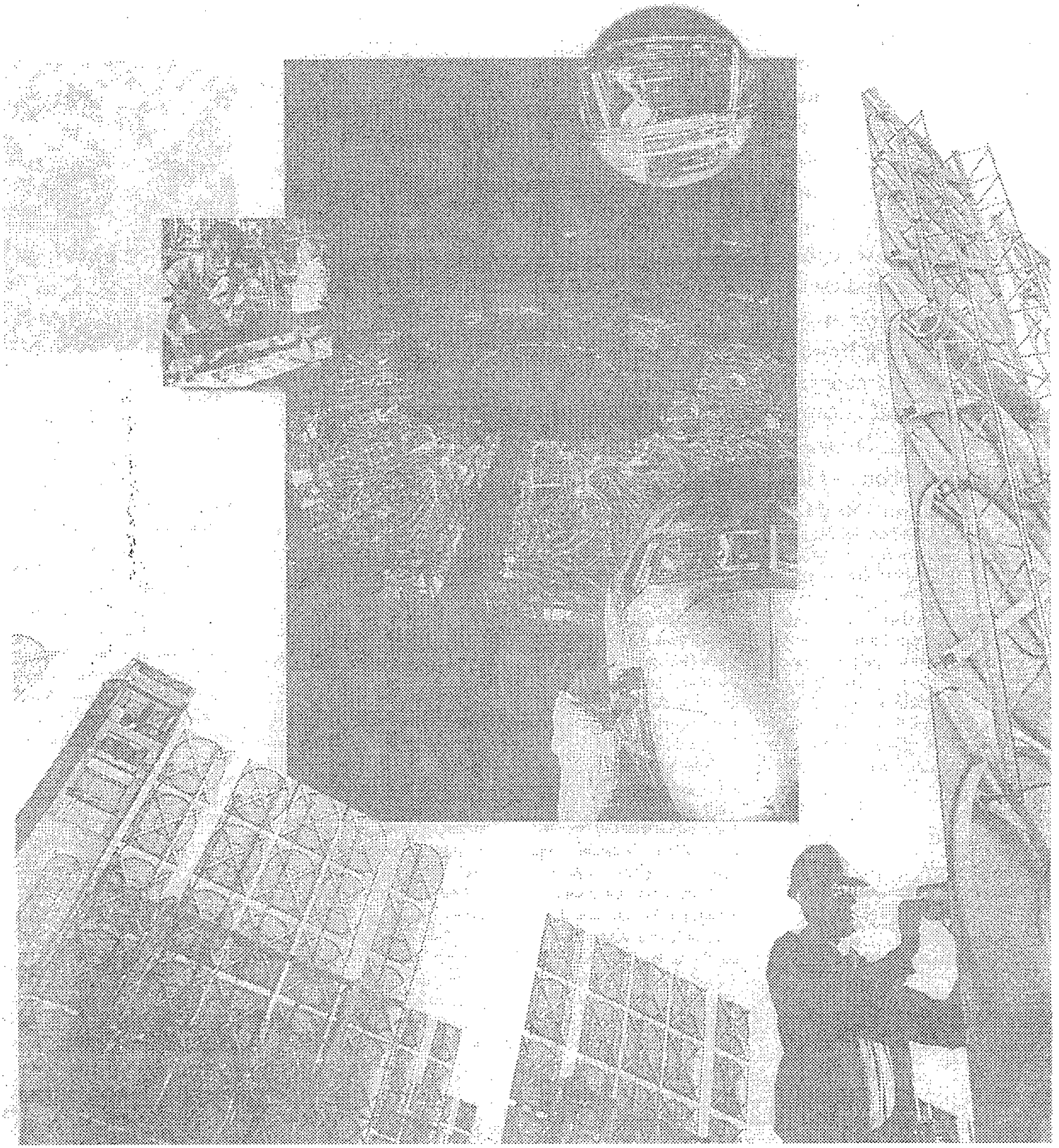
Operation of the Environmental Protection Agency's National Computer Center in Raleigh, North Carolina, and in Washington, D.C., began in 1992. In 1995, responsibility was extended to include full operation of the National Center for Environmental Supercomputer Center in Bay City, Michigan.

Michael F. Cammarata
President
Services Group

Synergies from the Martin Marietta-GE Aerospace combination also have resulted in opportunities for competitive pricing. Services Group won the contract to continue maintenance of sonar arrays for the Navy. These arrays are towed behind submarines and surface ships for detection of ships and submarines. The Group's competitive cost structure, combined with Aero & Naval Systems' technical expertise, enabled Martin Marietta to retain the business, the first strengthening the Corporation's position as a provider of fleet combat services.

International operations continue in Japan, Taiwan, Turkey, Egypt, Oman, Germany, Puerto Rico and the Caribbean. Especially noteworthy was a contract won in 1995 to provide air traffic control radar for Kuwait, replacing a system lost in the Gulf War.

Clockwise from top: Martin Marietta Services Group's Environmental Protection Agency Computer Center in Raleigh, North Carolina; Martin Marietta Services Group's Hill Air Force Station Range; Martin Marietta Services Group's Spacelab mission, October 1995.



In October, Martin Marietta's Sandia Corporation began managing and operating the Department of Energy's Sandia National Laboratories, with facilities in Albuquerque, New Mexico; Livermore, California; Tonopah, Nevada; and Kauai, Hawaii. Martin Marietta also formed Technology Ventures Corporation to assist in the commercialization of technologies developed by federal laboratories and universities in New Mexico.

With assets valued at more than $1 Billion, Sandia National Laboratories' specialized facilities are used for process development, environmental testing, high-performance computing and research on radiation effects, combustion and microelectronics.

Over the past 40 years, Sandia has expanded its missions from nuclear weapons activities to include additional advanced military technologies, energy and the environment, arms control technologies, advanced manufacturing processes, information science and technology and electronics. With the downsizing of the federal defense budget, Sandia has assumed responsibility for transferring commercially viable technologies to the private sector.

As one of the national laboratories designated to maintain the U.S. nuclear arsenal, Sandia ensures that these weapons will function as required should they ever be needed. Sandia conducts quality assurance evaluations on nuclear weapons to ensure their safety and reliability and, as a means of aiding disarmament, has developed special physical and robotic processes to minimize radiation exposure to personnel.

Sandia also has developed environmental technologies for nuclear waste management and issue minimization in weapons production, manufacture and disposal. These efforts include developing technologies for detoxification of chemical waste in soil and groundwater and improving detection devices and analytical techniques for monitoring environmental.

In its efforts to strengthen the nation's economic security by transferring technology to the private sector, Sandia has entered into 140 Cooperative Research and Development Agreements with companies including AT&T, General Motors, Motorola and Sun Microsystems.

Work on new energy technologies continued in 1990, with particular focus on renewable sources, oil and gas recovery and conservation. Much of this work involves joint projects with private companies.

Sandia scientists and engineers are focused on helping entire industries become more competitive. Examples include Cooperative Research and Development Agreements with the National Center for Manufacturing Sciences, the Specialty Metals Processing Consortium, the Edison Welding Institute, SEMATECH (the consortium of U.S. semiconductor manufacturers) and the Department of Defense. In April, Sandia and SEMATECH signed a multi-year working agreement to develop technologies for the next generation of integrated circuits.

Dr. Albert Narath
Director
Sandia National Laboratories

Sandia National Laboratories, shown in front, has eight "gateway" buildings in the design process, providing individual cells to most energy focus research in new partnerships for strength in numbers. Individuals religious to leadership research: Sandia hopes to attract a portable home from its relocation.

Martin Marietta's Advanced Development Operations and Laboratories work with operating units to formulate shared visions of new products that anticipate future requirements in space, defense, information systems and commercial markets. From research in electronics, materials and information processing, Martin Marietta scientists and engineers focus on developing products and technologies that meet these needs.

The research and development operations from Martin Marietta and former GE Aerospace are consolidated under a single technology organization with operating elements in California, Maryland, New Jersey and New York.

Robert J. Wheeler
Vice President
Technology

In San Diego, Advanced Developmental Operations demonstrated the ability of the Low-Cost Anti-Armor Submunition, a millimeter-wave radar seeker that can be launched from a variety of platforms against tanks and other ground targets, to quickly acquire and discriminate target classes. Flight test and drop tests are expected to begin in early 1994. This new low-cost seeker technology promises to be applicable to numerous future programs employing target acquisition radar.

A major development program is underway to compete for the Army's Corps Surface-to-Air Missile program. The Corporation's team includes Ocean, Radar & Sensor Systems and the Laboratories in Syracuse, New York, working on sensor radars; Electronics & Missiles, Orlando, Florida, developing the missile airframe and propulsion system and integrating the seeker; and Advanced Development Operations, which is preparing seekers and high-power amplifiers for the radars.

Martin Marietta Laboratories in Baltimore is leading a multi-partner team comprising aerospace firms, suppliers, universities and government laboratories that received one of the first contracts to be awarded under the U.S. Government's dual-use technology initiative. The program will develop low-cost, broadband, active anti-vibration techniques, utilizing company expertise in ceramics and shape memory alloys. Among a variety of potential applications, this research in vibration isolation should help make airplane cabins more comfortable and improve tooling for ultra-fine machining.

The Laboratories in Baltimore also has developed a prototype lightweight, broadband, variable-depth sonar. The acoustic projection system was subjected to Navy and independent testing and demonstrated an improved capability to help detect submarines and mines in shallow waters.

Martin Marietta continued development of high-speed, real-time parallel signal processors for underwater imaging and radar and produced units as small as five-by-seven inches. Research on signal processing for automated target recognition led to new capabilities in human speech

Technology Operations, the leader from left center, and from very interconnections, magnified flat beam, fingerprint identification and graphical signal processor. Microwave demodulation, the film depot, Accumulator Precision Approach and Landing System, a portion of microwave instrument integrated circuit, center, is the "heart" radar.

Engineers Edward J. Fasano, left, and Philip M. Kahn test a proprietary high-power laser at the Corporation's Laser Test Facility in a Class 100 clean room, Baltimore.

and fingerprint identification and in speech compression.

In a technical breakthrough in optical signal processing, Martin Marietta developed new devices that provide a 1,000-fold improvement in performance over current processors.

The Laboratories in Moorestown, New Jersey, teamed with other industry leaders and research scientists to win an Army contract for Rapid Prototyping of Application-Specific Signal Processors. This program is expected to result in a significant decrease in the time needed to design and develop digital processors, benefiting equipment manufacturers in both defense and commercial markets.

Martin Marietta engineers in Syracuse successfully demonstrated 17 transmit/receive modules made from Microwave High-Density Interconnect technology, replacing conventional wire bonds and reducing the size of the units by at least one-half. Developed for the Air Force, these modules offer performance, reliability and cost improvements for defense and civil radar systems and communications antennas.

In a related technology bid, Martin Marietta is now teamed with GE and Texas Instruments in a competition for a contract to develop high-density microwave packaging for advanced radar systems.

Martin Marietta is a leader in the technology of phased arrays. These multi-dimensional radars transmit without mechanical scanning, permitting lighter weight and more reliable pointing and tracking systems. During the year, the Corporation demonstrated for the Air Force a unique multichannel phase-based radar. Fiber-optic controlled phased-array technology also is being developed for the Army for future microwave radar systems and for advanced, low-cost components for computers of the future.

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Statement of Earnings

for years ended December 31

(add 000, except per share)	1993	1992	1991
Net sales	$9,435,689	$5,954,292	$6,076,415
Cost of sales, other costs and expenses	8,647,224	5,405,123	5,537,926
Earnings from Operations	788,465	549,169	537,489
Other income and expenses, net	46,997	21,144	(58,980)
	835,462	570,313	478,509
Interest expense on debt	110,173	57,890	57,660
Earnings before taxes on income and cumulative effect of accounting changes	725,289	512,423	420,849
Taxes on income	275,000	167,000	107,700
Earnings before Cumulative Effect of Accounting Changes	450,289	345,423	313,149
Cumulative effect of changes in accounting for post-retirement benefits other than pensions and for post-employment benefits	(429,432)	—	—
Net Earnings	$ 20,857	$ 345,423	$ 313,149
Net Earnings (Loss) Per Common Share			
Assuming no dilution:			
Before cumulative effect of accounting changes	$4.25	$3.60	$3.15
Cumulative effect of accounting changes	(4.51)	—	—
	$ (.26)	$3.60	$3.15
Assuming full dilution:			
Before cumulative effect of accounting changes	$3.80	$3.60	$3.15
Cumulative effect of accounting changes	*	—	—
	*	$3.60	$3.15

*Anti-dilutive

Balance Sheet

at December 31

Assets

(add 000)	1993	1992
Current Assets:		
Cash and cash equivalents	$ 373,895	$ 239,642
Receivables	1,435,515	790,283
Inventories	358,749	360,878
Current deferred income taxes	238,642	61,242
Other current assets	42,239	42,296
Total Current Assets	2,448,240	1,454,341
Other Noncurrent Assets	707,772	800,445
Noncurrent Deferred Income Taxes	206,119	—
Property, Plant and Equipment, net	1,892,753	1,257,139
Cost in Excess of Net Assets Acquired	1,914,894	26,234
Other Intangibles	775,113	81,456
	$7,744,891	$3,599,605

Liabilities and Shareowners' Equity

(add 000)	1993	1992
Current Liabilities:		
Accounts payable	$ 536,799	$ 247,825
Other current liabilities	572,343	125,069
Salaries, benefits and payroll taxes	333,602	177,847
Income taxes	48,847	31,681
Current maturities of long-term debt	318,525	5,814
Total Current Liabilities	1,810,116	588,236
Long-term Debt	1,479,571	474,726
Post-retirement Benefits	740,630	101,978
Other Noncurrent Liabilities	838,222	194,195
Noncurrent Deferred Income Taxes	—	297,254
Shareowners' Equity:		
Series A preferred stock, liquidation preference $50 per share	1,000,000	—
Common stock, par value $1 a share, authorized 500,000,000 shares	95,697	47,329
Additional paid-in capital	123,699	85,992
Retained earnings	1,656,656	1,811,905
	2,876,352	1,945,216
	$7,744,891	$3,599,605

The notes on pages 44 to 54 are integral parts of these statements.

Statement of Cash Flows

for years ended December 31

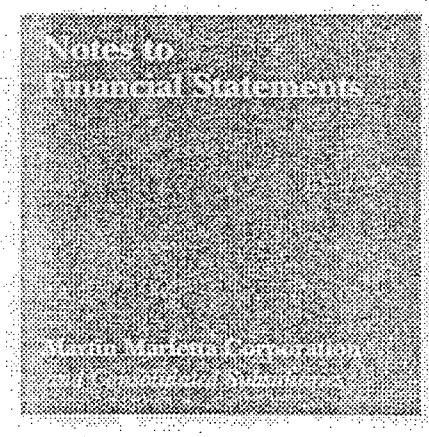
(add 000)	1993	1992	1991
Cash Flows from Operating Activities:			
Net earnings	$ 20,857	$345,123	$313,149
Adjustments to reconcile net earnings to net cash provided by operating activities:			
Cumulative effect of changes in accounting for post-retirement benefits other than pensions and for post-employment benefits	429,432	—	—
Depreciation, depletion and amortization	349,982	220,147	225,072
Deferred income taxes	15,420	11,540	(327,180)
Net changes in receivables, inventories and payables	(272,655)	220,930	(121,503)
Commercial Titan deferred revenue	—	(137,088)	37,330
Goodwill and intangible amortization	86,216	12,602	9,518
Other items	10,407	8,643	42,522
Net Cash Provided by Operating Activities	630,259	677,997	178,917
Cash Flows from Investing Activities:			
Additions to properties, net of purchased operations	(214,810)	(170,889)	(212,326)
Retirement of properties, net of sold facilities	35,153	13,710	15,404
Acquisition GE Aerospace	(883,198)	—	—
Purchases of operations	(15,980)	(18,806)	(31,500)
Reductions (additions) to investments	108,959	(19,317)	—
Other	(18,488)	(73)	15,959
Net Cash Used for Investing Activities	(988,388)	(195,375)	(202,272)
Cash Flows from Financing Activities and Dividends:			
Debt transactions:			
Decrease in short-term borrowings	—	—	(28,000)
Increase in long-term debt	700,135	4,282	207,972
Repayments of long-term debt	(107,213)	(197,583)	(6,447)
Equity transactions:			
Issuances of common stock	17,023	20,850	40,614
Purchases of common stock	—	(105,007)	(30,025)
Dividends:			
Preferred stock	(45,353)	—	—
Common stock	(85,030)	(76,060)	(74,680)
Net Cash Provided by (Used for) Financing Activities and Dividends	481,562	(419,532)	105,436
Net Increase in Cash and Cash Equivalents	123,433	63,087	83,081
Cash and Cash Equivalents at beginning of year	239,642	170,555	87,474
Cash and Cash Equivalents at end of year	$ 373,095	$239,642	$170,555
Supplemental Schedule of Investing and Financing Activities			
Non-cash consideration—Acquisition GE Aerospace:			
Assumption of certain payment obligations	$ 750,000	—	—
Issuance of preferred stock	1,000,000	—	—
	$1,750,000	—	—

Statement of Shareowners' Equity

for years ended December 31

(add 000)	Preferred Stock	Common Stock	Additional Paid-in Capital	Retained Earnings	Total Shareowners' Equity
Balance at January 1, 1991	$ —	$48,866	$187,944	$1,304,153	$1,540,963
Net earnings for 1991	—	—	—	313,149	313,149
Cash dividends declared on common stock ($.75 a share)	—	—	—	(74,680)	(74,680)
Stock awards and options exercised, net of stock tendered in payment	—	1,032	43,291	—	44,323
Other common stock issued	—	319	15,852	—	16,171
Common stock purchased	—	(687)	(36,336)	—	(36,023)
Balance at December 31, 1991	—	49,530	211,751	1,542,622	1,803,903
Net earnings for 1992	—	—	—	345,423	345,423
Cash dividends declared on common stock ($.795 a share)	—	—	—	(76,050)	(76,050)
Stock options exercised, net of stock tendered in payment	—	460	20,376	—	20,836
Other common stock issued	—	310	15,841	—	16,151
Common stock purchased	—	(3,001)	(161,976)	—	(165,067)
Balance at December 31, 1992	—	47,229	85,992	1,811,995	1,945,216
Net earnings for 1993	—	—	—	20,857	20,857
Preferred stock issued	1,000,000	—	—	—	1,000,000
Cash dividends declared on preferred stock ($2.25 a share)	—	—	—	(48,333)	(48,333)
Cash dividends declared on common stock ($.87 a share)	—	—	—	(85,030)	(85,030)
Stock awards and options exercised, net of stock tendered in payment	—	407	22,412	—	22,819
Other common stock issued	—	228	15,595	—	15,823
Issuance of shares to effect 2-for-1 stock split	—	47,833	—	(47,833)	—
Balance at December 31, 1993	$1,000,000	$95,697	$123,999	$1,650,656	$2,870,352

The notes on pages 44 to 54 are integral parts of these statements.



Note A: Accounting Policies

Consolidation Basis Consolidated financial statements include the accounts of all significant majority-owned subsidiaries of the Corporation. All material intercompany transactions have been eliminated in consolidation.

Certain amounts for the prior periods have been reclassified to conform with the 1993 presentation.

Cash and Cash Equivalents Cash and cash equivalents generally comprise highly liquid instruments with original maturities of three months or less from date of purchase.

As of December 31, book cash balances amounted to net overdrafts of $48,020,000 in 1993 and $26,390,000 in 1992 and are attributable to the float of the Corporation's outstanding checks.

Investments Valuation Marketable investment securities are carried at the lower of aggregate cost or market value. Specific costs are used to compute realized gains or losses.

Investments in associated companies are accounted for by the equity method wherever the Corporation is able to significantly influence operating and financial matters. Other investments are carried at cost less valuation allowances where appropriate.

Revenues Recognition Long-term, fixed-price contracts generally are accounted for under percentage-of-completion methods, and sales include a proportion of the earnings expected to be realized in the ratio that costs incurred bear to estimated total costs. Sales are recorded on cost-type contracts as costs are incurred. Under all other contracts, sales are recorded when deliveries are made or as work is performed.

Contracts and programs in progress are reviewed quarterly, and sales and earnings are adjusted in current accounting periods based on revisions in contract value and estimated costs at completion. Performance incentives are incorporated in certain contracts that provide increased or decreased earnings based on performance to established targets. Incentives based upon cost performance are recorded currently, and other incentives and awards are recorded when the amounts reasonably can be estimated or are awarded. Provisions for estimated losses on contracts and programs are recorded when identified.

Commercial Titan sales for the initial program, completed in 1992, were recorded upon the delivery of launch services. Cost of sales attributable to each launch was determined under the program average cost method. Cost of sales on any future Commercial Titan vehicles will be determined on a specific contract identification basis.

Sales in the Materials segment are recorded upon shipment of products or performance of services.

Inventories Valuation Inventories are stated at the lower of cost or market. Costs on contracts and programs in progress represent recoverable costs incurred for production, research and development and selling, general and administration, less amounts attributed to cost of sales, generally under percentage-of-completion accounting methods. Costs of other product and supply inventories are principally determined by the first-in, first-out (FIFO) method.

Properties and Depreciation Property, plant and equipment, including capital leases, are carried at cost, including interest cost capitalized during construction on significant capital programs.

Depreciation and amortization of properties are computed over estimated service lives generally using accelerated methods, except for Materials and other businesses that utilize the straight-line method. Depletion of mineral deposits is calculated over estimated recoverable quantities by the unit-of-production method.

Intangible Assets Costs in excess of net assets acquired are amortized ratably over appropriate periods ranging from 20 to 40 years. Other intangibles represent amounts assigned principally to the value of programs acquired and are amortized over periods not exceeding 15 years.

Income Taxes Current income tax provisions represent estimated amounts payable or recoverable for each year after adjustments for permanent differences. Deferred income tax provisions represent the tax effect of all significant temporary differences between financial statements and income taxes.

Research and Development and Similar Costs Research and development and similar costs are charged to operations as incurred unless reimbursable under specific contractual arrangements. Independent research and development, systems studies, other concept formulation studies and bid and proposal work relating to government contracts represent a major portion of these expenses. Such amounts are allocated when appropriate to government contracts through overhead under government-mandated cost accounting procedures.

Preoperating costs are generally charged to operations as incurred, except that such costs for significant new products or services and start-up costs of certain facilities may be deferred for amortization over periods not to exceed five years.

Earnings Per Common Share Earnings per share are based on the weighted average number of common shares outstanding during the year.

Earnings per share, assuming no dilution, were computed in 1993 based on net earnings less the dividend requirement of preferred stock. The weighted average number of common shares outstanding assuming no dilution were 95,346,814 in 1993, 95,868,708 in 1992 and 99,341,210 in 1991.

Fully diluted earnings per share in 1993 assumed that the average number of common shares was increased by the conversion of preferred stock from the date of issue and by dilutive stock options. The weighted average number of common shares outstanding, assuming full dilution, were 118,247,041 in 1993, 95,868,708 in 1992 and 99,341,210 in 1991.

On September 30, 1993, a 2-for-1 split of the Corporation's common stock in the form of a 100% stock dividend became effective. All references in the consolidated financial statements with regard to the number of shares and per share data have been restated to reflect the split.

Note B: Business Combination with GE Aerospace

On November 22, 1992, Martin Marietta Corporation entered into a Transaction Agreement with General Electric Company (GE) to combine the aerospace and certain other businesses of GE (collectively, the "GE Aerospace businesses") with the businesses of Martin Marietta Corporation in the form of affiliated corporations. The transaction (the "GE Transaction"), was consummated on April 2, 1993, and GE Aerospace operations have been included since that date.

The exchange consideration of approximately $3 billion for the GE Transaction consisted of cash, preferred stock, retention by GE of certain accounts receivable and the assumption of payment obligations related to certain GE indebtedness. The GE Transaction has been accounted for under the purchase method of accounting, wherein approximately $1.9 billion in goodwill was recognized by the Corporation after recording approximately $700 million in other intangibles (representing the estimated fair market value of certain assets) and other purchase adjustments necessary to allocate the purchase price to the value of assets acquired and liabilities assumed. Goodwill is being amortized over a 40-year period, and the other intangibles are being amortized over a 15-year period.

The Martin Marietta securities owned by GE are held under a Standstill Agreement. Among other things, the Standstill Agreement provides for certain limitations on either the increase or disposal of GE's interest in voting securities of Martin Marietta, on GE's solicitation of proxies and shareowner proposals, on GE's voting of its shares and on GE's ability to place or remove members of Martin Marietta's Board of Directors. In addition, the Standstill Agreement requires Martin Marietta to recommend to its shareowners the election of persons designated by GE to serve as directors of Martin Marietta. Generally, the Standstill Agreement provides that GE's designees will at all times constitute at least 10% of Martin Marietta's Board of Directors.

In 1986, the Board of Directors adopted a Shareholder Rights Plan to distribute, under certain circumstances, one Common Stock Purchase Right for each outstanding share of the Corporation's common stock. The Rights Plan was amended during 1990. Under the amended plan, the Rights became exercisable if a person or group acquires, in a transaction not approved by the Board of Directors, 15% or more of the Corporation's common stock or announces a tender offer for 30% or more of the stock. The GE Transaction was approved by the Board of Directors of the Corporation and therefore did not constitute a "Change of Control" for purposes of the shareholder rights plan. The new Martin Marietta Corporation has not adopted a shareholder rights plan.

The following unaudited pro forma information presents the results of operations of the Corporation and the GE Aerospace businesses for the years ended December 31, 1993 and 1992, with pro forma adjustments as if the GE Transaction had been consummated as of the beginning of the periods presented. This pro forma information does not purport to be indicative of what would have occurred had the acquisition been made as of those dates or of results which may occur in the future.

Note B: (continued)
Business Combination with GE Aerospace

Pro Forma Information (Unaudited)

(millions, except per share)	1993	1992
Net Sales	$10,469	$11,292
Earnings before cumulative effect of accounting changes attributable to common stock	$401	$418
Net earnings (loss) attributable to common stock	$(28)	$418
Earnings (loss) per common share assuming no dilution:		
Before cumulative effect of accounting changes	$4.21	$4.36
Net earnings (loss) per common share	$(.29)	$4.36

Note C:
Receivables

(old 000)	1993	1992
Receivables under long-term contracts:		
United States Government:		
Amounts billed	$ 331,815	$149,472
Unbilled costs and accrued profits	749,748	646,586
Amounts withheld, due upon completion of contracts	42,999	22,112
	1,124,563	818,170
Other customers:		
Amounts billed	105,916	28,442
Unbilled costs and accrued profits	290,260	146,556
Total receivables under long-term contracts	1,520,739	993,168
Less noncurrent amounts	187,931	295,138
	1,322,808	698,030
Other Activities:		
Commercial accounts receivable	85,209	82,226
Notes and other current receivables	43,525	15,847
	1,451,542	796,103
Less allowances	16,027	5,820
Total	$1,435,515	$790,283

Unbilled costs and accrued profits will be billed on the basis of contract terms and delivery schedules.

Amounts billable after one year are included in other noncurrent assets.

Note D:
Proposed Transactions

In December 1993, the Corporation signed an agreement to purchase the Space Systems Division of General Dynamics Corporation for approximately $200 million in cash. The transaction is subject to regulatory approval and the satisfaction of certain other conditions and is expected to close during the first half of 1994. The purchase method of accounting will be used to record this transaction.

In December 1993, Martin Marietta Materials, Inc., a wholly-owned subsidiary of Martin Marietta Technologies, Inc., filed a registration statement with the Securities and Exchange Commission for an underwritten public offering of its common stock. The proposed offering will consist of 7,650,000 shares plus a 30-day overallotment option for the underwriters to purchase up to 1,147,500 additional shares. The initial public offering by Martin Marietta Materials is dependent upon market conditions, but is expected to close in February 1994, after which the Corporation will own approximately 85% of the outstanding stock of the company, or 81% if the overallotment is exercised.

Note E:
Inventories

(old 000)	1993	1992
Costs on contracts and programs in progress	$1,284,534	$311,234
Less: progress payments	830,372	14,093
noncurrent amounts	168,999	67,343
	285,163	229,798
Other Activities:		
Finished products	50,029	45,907
Products in process and raw materials	10,106	11,586
Expendable parts and supplies	13,451	14,142
Total	$ 358,749	$300,878

According to provisions of certain U.S. Government contracts, the customer has title to, or a security interest in, inventories for contracts and programs in progress of approximately $310,250,000 for 1993 and $3,700,000 for 1992.

Selling, general and administrative costs in connection with production under long-term government contracts were charged to inventories as incurred in the amounts of $377,470,000 in 1993 and $310,780,000 in 1992. The estimated amounts remaining in inventories were $126,900,000 at December 31, 1993, and $17,800,000 at December 31, 1992.

Costs on contracts and programs in progress at December 31, 1993 and 1992, did not include any significant amounts of production costs or other deferred costs or claims and similar items subject to uncertainty concerning their realization.

Note F:
Property, Plant and Equipment, Net

(add 000)	1993	1992
Land	$ 105,398	$ 150,873
Mineral deposits	38,575	35,345
Buildings	836,694	600,077
Machinery and equipment	2,733,667	2,261,945
	3,894,334	3,144,243
Less allowances for depreciation, depletion and amortization	2,111,581	1,887,104
Total	$1,692,753	$1,257,139

Note G:
Debt

(add 000)	1993	1992
Long-term debt:		
Payment obligations assumed	$ 622,162	$ —
9½% Notes due 1995	125,000	125,000
8⅝% Notes due 1996	100,000	100,000
9% Notes due 2003	100,000	100,000
6¾% Notes due 2003	400,000	—
7% Debentures due 2011	101,511	100,439
7⅝% Debentures due 2013	150,000	—
7¾% Debentures due 2023	150,000	—
Other notes and obligations	49,423	53,101
Total	1,798,096	478,540
Less current maturities	318,525	3,814
Long-term debt	$1,479,571	$474,726

Payment obligations assumed as part of the exchange consideration for the GE Transaction relate to certain GE indebtedness. Approximately $304 million of these obligations at December 31, 1993, mature in 1994 and carry an effective interest rate of 4.4%, and $318 million mature in 1996 and carry an effective interest rate of 5.025%. In December 1993, $103 million of the debt obligations were defeased in-substance.

The 9½% Notes, 8⅝% Notes and 9% Notes are not redeemable prior to maturity.

The 6¾% Notes were issued on April 22, 1993, and are not redeemable prior to maturity.

The 7% Debentures were sold at 53.83% of their principal amount of $175,000,000 in 1981. These debentures are carried net of original issue discount, which is being amortized by the interest method over the life of the issue. The effective interest rate is 18¼%. The debentures are redeemable in whole or in part at the Corporation's option at any time at 100% of their principal amount.

The 7⅝% Debentures and 7¾% Debentures were issued on April 22, 1993. The 7⅝% Debentures are not redeemable prior to maturity. The 7¾% Debentures may not be redeemed by the Corporation prior to April 15, 2003, but on or after that date may be redeemed by the Corporation at specified redemption prices.

Other notes and obligations include a $17-million, 8⅝% Real Estate Mortgage secured by property in Maryland having a net book value of approximately the same amount at December 31, 1993.

Maturities of long-term debt during the five-year period ending December 31, 1998, are $318,525,000 in 1994, $129,500,000 in 1995, $121,976,000 in 1996, $674,000 in 1997 and $691,000 in 1998.

At December 31, 1993, the independently determined market value of the 7% Debentures exceeded book value by approximately $70 million. The independently determined aggregate market value of the Corporation's other outstanding debt approximated book value.

Interest payments were $86,840,000 in 1993, $61,020,000 in 1992 and $55,820,000 in 1991. Interest expense on debt was net of capitalized interest of $2,857,000 in 1993, $3,717,000 in 1992 and $5,737,000 in 1991 and included commitment fees of approximately $2,210,000 in 1993 and $750,000 in 1992 and 1991.

As of December 31, 1993, the Corporation has issued letters of credit totaling $347,500,000 relating to certain long-term contracts and other contractual obligations.

In 1993, Martin Marietta Technologies, Inc., a wholly owned subsidiary (see Note J, page 48), and Martin Marietta Corporation replaced a previous credit facility with a 364-day revolving credit facility in the amount of $900 million expiring on March 30, 1994, and a three-year revolving credit facility in the amount of $1.3 billion that expires on March 31, 1996. Effective September 1, 1993, Martin Marietta Technologies, Inc., reduced the amounts committed under the facilities. The $900-million facility was reduced to $500 million and the $1.3-billion facility was reduced to $800 million. These borrowing facilities may be used for general corporate purposes. Under these credit facilities, the Corporation is subject to limitations on its financial leverage and a minimum coverage ratio as defined by the agreements.

The financing agreements of Martin Marietta Corporation and its subsidiaries contain certain restrictive covenants, including requirements for limitations on encumbrances and on sale and lease-back transactions.

Note H: Shareowners' Equity

The current authorized capital structure of Martin Marietta Corporation includes 20,000,000 shares of Series A Preferred Stock with par value of $1 a share (liquidation preference $50 per share), which pays dividends at an annual rate of $3.00 per share (6%) and are cumulative. In 1993, the Preferred Stock dividends became effective from the date of closing of the GE Transaction. As part of the consideration for the GE Transaction, the Corporation issued to GE all of the authorized and outstanding shares of Series A Preferred Stock of Martin Marietta, which shares are convertible into approximately 23% of the shares of Martin Marietta common stock after giving effect to such conversion (calculated as of December 31, 1993), and have an aggregate liquidation preference of $1 billion. The Series A Preferred Stock is nonvoting stock except in special circumstances, and GE and Martin Marietta have entered into a Standstill Agreement that imposes certain limitations on GE's ability to, among other things, acquire or dispose of Martin Marietta voting securities (see Note B, page 45).

The Corporation's capital structure also includes 30,000,000 shares of Preferred Stock with par value of $1 a share, none of which is currently issued.

In 1993, the Board of Directors authorized the repurchase of approximately 32.4 million of the Corporation's common shares for use in connection with the Corporation's Amended Omnibus Securities Award Plan, Performance Sharing Plan and for general corporate purposes. No share repurchases were made by the Corporation during 1993.

The Corporation contributed 228,080 shares in 1993, 310,608 shares in 1992 and 318,633 shares in 1991 of its common stock to the Martin Marietta Performance Sharing Plan for Salaried Employees in accordance with provisions set forth in that plan.

Under Maryland General Corporation Law, shares of common stock reacquired by a corporation constitute unissued shares. For financial reporting purposes, reacquired shares are recorded as reductions to issued common stock and to additional paid-in capital.

At December 31, 1993, retained earnings were unrestricted.

Note I: Contingencies

In the opinion of management and counsel, the probability is remote that the outcome of litigation and other proceedings, including those pertaining to environmental matters (see Analysis of Financial Condition and Operating Results, page 58), relating to Martin Marietta and its subsidiaries, will have a material adverse effect on the results of the Corporation's operations or its financial position.

Note J: Martin Marietta Technologies, Inc.

The GE Transaction resulted in a newly formed Maryland corporation, Martin Marietta Corporation. The former Martin Marietta Corporation changed its name to Martin Marietta Technologies, Inc.

Upon consummation of the GE Transaction, Martin Marietta had the same common stockholders (holding the same number of shares) as Martin Marietta Technologies, Inc., had immediately prior to the GE Transaction. GE's sole equity interest in Martin Marietta following the consummation of the GE Transaction is its ownership of all of the authorized and outstanding shares of Series A Preferred Stock of Martin Marietta Corporation.

Summarized financial information for Martin Marietta Technologies, Inc., a wholly owned subsidiary of the Corporation, follows:

(millions)	1993	1992
Current assets	$1,585	$1,434
Noncurrent assets	3,163	2,106
Current liabilities	825	686
Long-term debt	1,161	475
Other noncurrent liabilities	886	594
Shareowners' equity	1,876	1,945
Net sales	$5,628	$5,954
Earnings from operations	588	549
Earnings before cumulative effect of accounting changes	358	340
Cumulative effect of accounting changes	(427)	—
Net earnings (loss)	(69)	345

Martin Marietta Corporation has guaranteed the payment of certain debt and other obligations of Martin Marietta Technologies, Inc. The total of such guarantees was $1.2 billion at December 31, 1993. Exposure to credit risk in the event of non-payment by the obligor is represented by the contractual amount of the relative instruments. No loss is anticipated under these guarantees. As of December 31, 1993, there were no restrictions on dividends or other distributions between Martin Marietta Technologies, Inc., and the Corporation.

Note K: Leases

Total rental expense for all operating leases was $148,200,000 in 1993, $82,700,000 in 1992 and $97,280,000 in 1991.

Future minimum rental commitments for all noncancelable operating leases are: $112,040,000 for 1994, $85,160,000 for 1995, $58,930,000 for 1996, $41,630,000 for 1997, $33,330,000 for 1998 and $65,270,000 for later years.

Note L:
Stock Option and Award Plans

	Number of Shares		Option Price	
	Available for Grant	Options Outstanding	Per Share Range	Total (add 000)
YEAR 1992:				
January 1	3,224,900	3,661,750	$11.665 — $29.25	$ 86,673
Additions	1,287,778	—	—	—
Options granted	(1,189,800)	1,189,800	25.75	30,637
Exercised	—	(1,420,100)	11.665 — 29.25	(30,936)
Deregistered	(3,250,800)	—	—	—
Canceled	31,400	(31,400)	19.75 — 29.25	(750)
Expired	(6,000)	—	—	—
December 31	97,978	3,411,050	$11.665 — $29.25	$ 85,915
Exercisable at December 31		1,208,050		
YEAR 1993:				
January 1	97,978	3,411,050	$11.665 — $29.25	$ 85,915
Additions	2,095,300	—	—	—
Options granted	(1,217,600)	1,217,600	40.375 — 44.50	49,173
Awards granted	(170,000)	—		
Exercised	—	(809,850)	11.665 — 29.25	(19,347)
Canceled	8,800	(8,800)	19.938 — 40.375	(259)
Expired	—	(3,600)	—	—
December 31	814,478	3,812,400	$19.750 — $44.50	$115,482
Exercisable at December 31		1,490,800		

In 1992, the Corporation adopted an Omnibus Securities Award Plan, which was subsequently amended in 1993. Under the Amended Omnibus Securities Award Plan (Amended Omnibus Plan), employees of the Corporation may be granted stock-based incentive awards, including options to purchase common stock, stock appreciation rights, restricted stock or other stock-based incentive awards. These awards may be granted either singly or in combination with other awards. Under the Amended Omnibus Plan, the number of shares of stock available for awards in 1992 was 1.9% of the shares of common stock outstanding on December 31, 1991, and the number of shares of stock available for awards for each year in the period 1993 through 1996 shall not exceed 1.7% of the shares of common stock outstanding on December 31 of the previous year. The Amended Omnibus Plan further provides that for the years 1995, 1994 and 1995, an additional 0.5% of the shares of common stock outstanding on December 31 of the previous year may be granted if a corresponding percentage decrease in shares available for award is made the following year. Effective with the adoption of the Omnibus Securities Award Plan in 1992, no further grants of options, stock appreciation rights or restricted stock could be made under any of the Corporation's prior plans. However, all outstanding grants and awards under those prior plans will remain in effect in accordance with their terms.

Under the Amended Omnibus Plan, the Corporation grants options to purchase its common stock at a price equal to the market value at the date of grant. These options become exercisable in three equal annual installments beginning one year after date of grant and expire 10 years from such date. The Amended Omnibus Plan allows the Corporation to provide for financing of purchases, subject to certain conditions, by interest-bearing notes payable to the Corporation.

Prior stock option plans included the same grant pricing, vesting and expiration terms as the Amended Omnibus Plan. The 1984 Plan allows the Corporation to provide for financing of purchases, subject to certain conditions, by interest-bearing notes payable to the Corporation.

The 1979 and 1984 Plans included stock appreciation rights granted simultaneously in equal number with the grant of stock options. These rights may be exercised independently of the options and entitle a grantee to receive in cash an amount equal to a percentage of the increase in the market value of the Corporation's common stock. The 1979 Plan limits these payments to 100% of the option price.

The Amended Omnibus Plan provides for the issuance of common stock at par value subject to certain restrictions for a specified period of time. A total of 170,000 restricted shares was awarded under the Amended Omnibus Plan during 1993; no awards were made during 1992. Under the awards outstanding, participants are entitled to cash dividends and to vote their respective shares, but they are prohibited from selling or transferring shares during a restricted period. Upon adoption of the Omnibus Securities Award Plan in 1992 (as amended in 1993), no further awards could be made under the Restricted Stock Award Plan adopted in 1989, but the outstanding awards (totaling 116,000 shares) under that plan remain in effect in accordance with their terms.

Note M:
Post-Employment Benefit Plans

Martin Marietta and its consolidated subsidiaries sponsor a number of retirement plans that cover substantially all employees. Defined benefit plans for salaried and certain hourly employees provide benefits based on employees' years of service and compensation: either on a final or career average basis. Defined benefit plans for other hourly employees generally provide benefits of stated amounts for specified periods of service.

The Corporation's defined benefit pension plans comply with three principal standards: the Employee Retirement Income Security Act of 1974 as amended (ERISA), which in conjunction with the Internal Revenue Code, determines legal minimum and maximum deductible funding requirements; U.S. Government Cost Accounting Standards (CAS), which in conjunction with Federal Acquisition Regulations, establish rules for determining and measuring contractors' pension costs; and Statement of Financial Accounting Standards No. 87, "Employers' Accounting for Pensions" (FAS 87), which establishes rules for financial reporting. FAS 87 requires the recognition of actuarial values on a "termination" rather than an "ongoing" basis and specifies that certain key actuarial assumptions be adjusted annually to reflect current, rather than long-term, trends in the economy.

Consistent with the requirements of ERISA and CAS, it is the Corporation's funding policy to stabilize annual contributions as a percentage of payroll by utilizing the entry-age-normal actuarial cost method, with assumptions selected on the basis of long-term trends.

On December 31, 1993, retirement plan assets, which are held in a master trust, were invested principally in listed stocks and bonds and cash equivalents.

Certain health care and life insurance benefits are provided to eligible retirees by Martin Marietta or its consolidated subsidiaries. These benefit plans are funded by the Corporation through several trusts. For recently retired participants, the health benefits generally provide for cost sharing through participant contributions and copayments. For salaried employees who retired after 1992, there is an annual limit on the Corporation's contribution per participant.

Prior to 1993, the Corporation recognized the costs of retiree health benefits on a claims-paid basis. These costs were $33 million in 1992 and $27 million in 1991.

The Corporation has adopted Statement of Financial Accounting Standards No. 106, "Employers' Accounting for Postretirement Benefits Other Than Pensions" (FAS 106).

The net pension cost of defined benefit plans included the following components (add 000):

	1993	1992	1991
Service cost—benefits earned during the period	$164,663	$116,142	$108,716
Interest cost	272,591	189,114	172,084
Net amortization and other components	112,472	(115,846)	1,780
Actual return on assets	(402,644)	(76,242)	(180,715)
Net pension cost	$147,072	$109,158	$101,875
Assumptions used as of December 31:			
Plan discount rates	7.5%	6.5%-7.5%	6.5%-7.8%
Rates of increase in future compensation levels	6.0%	6.0%	6.0%
Expected long-term rate of return on assets	8.75%	8.0%	8.0%

The following table sets forth the defined benefit plans' funded status and amounts recognized in the Corporation's consolidated balance sheet as of December 31 (add 000):

	1993	1992
Plan assets at fair value	$4,048,738	$2,598,100
Actuarial present value of benefit obligations:		
Vested	$3,376,739	$2,202,594
Non-vested	65,860	24,764
Accumulated Benefit Obligation (ABO)	$3,442,599	$2,227,358
Projected Benefit Obligation (PBO)	$4,240,711	$2,538,914
Reconciling Items:		
Assets in excess of ABO	$606,139	$311,042
Effect of estimated future pay increases	(798,112)	(611,556)
Assets less than PBO	(191,973)	(300,514)
Unrecognized priorservice cost	63,830	102,161
Unrecognized net assets	(36,757)	(40,802)
Unrecognized loss	216,770	283,038
Prepaid pension cost	$ 51,870	$ 46,083

effective January 1, 1993. FAS 106 requires that the cost of certain post-retirement benefits be recognized under an accrual method of accounting instead of the prior practice of expensing the cost of such benefits as paid. The Corporation has elected to expense in the first quarter of 1993 the liability accumulated through 1992 due to the change in accounting method. This one-time transition obligation of $656 million resulted in an after-tax charge to net income of $412 million in the first quarter of 1993.

The Corporation's policy is to fund amounts that are consistent with the expense accrual under FAS 106, including an amortization payment for the transition obligation.

Since 1988, the Corporation has made contributions to the irrevocable trusts established to pay future health benefits to eligible retirees and dependents. On December 31, 1993, plan assets were invested principally in listed stocks and bonds and cash equivalents.

The net periodic post-retirement benefit cost for 1993 includes the following components (add 000):

Service cost—benefits earned during the period	$ 23,153
Interest cost	69,132
Net amortization and other components	12,586
Actual return on assets	(30,447)
Net periodic cost	$ 74,425

Assumptions used as of December 31:	
Discount rate	7.5%
Expected long-term rate of return on assets	8.75%

The trend rate for health care inflation is 8.5% for 1993 and 1994, trending down to 4.5% by 2001. The assumptions also include the impact of Medicare cost-sharing provisions which, when used in conjunction with the health care inflation rate, yields an effective health care cost-trend rate of approximately 12.5%.

The following table sets forth the post-retirement health care plans' funded status and estimated amounts recognized in the Corporation's consolidated balance sheet as of December 31, 1993 (add 000):

Plan assets at fair value	$ 279,577
Actuarial present value of benefit obligations:	
Active employees, eligible to retire	$ 67,038
Active employees, not eligible to retire	314,218
Former employees	743,297
Accumulated Projected Benefit Obligation (APBO)	$1,124,553
Assets less than APBO	$ 844,976
Unrecognized prior-service cost	7,189
Unrecognized loss	(111,535)
Post-retirement benefit liability	$ 740,630

A 1% increase in the health care cost trend rate would increase the APBO by approximately 8.6%, and would increase the sum of the service cost and interest cost by approximately 8.6%.

The Corporation has elected to adopt Statement of Financial Accounting Standards No. 112, "Employers' Accounting for Post-employment Benefits" (FAS 112). FAS 112 mandates that the cost of certain post-employment benefits be recognized under an accrual method of accounting instead of the current practice of expensing the cost of such benefits as paid. The effect of this change in accounting method resulted in a one-time, after-tax charge to net income of $17 million.

Note N: Other Income and Expenses

(add 000)	1993	1992	1991
Interest income	$ 8,245	$ 6,035	$ 12,864
Restructuring charge	—	—	(70,000)
Royalty income	32,694	9,729	14,007
Miscellaneous, net	6,658	5,380	(15,651)
Total	$46,897	$21,144	$(58,780)

The restructuring charge in 1991 represents the estimated cost of closing and selling related assets of the Corporation's International Light Metals operation and resulted in an after-tax loss of $89 million, or 30 cents per share. International Light Metals ceased operations in August 1992.

In 1991, miscellaneous includes the Corporation's equity in losses of $17,470,000 from International Light Metals Corporation.

Note O: Selling, General and Administrative Expenses

Selling, general and administrative expenses included in cost of sales, other costs and expenses were $509,290,000 for 1993, $466,100,000 for 1992 and $444,000,000 for 1991.

Note P: Research and Development

Research and development expenses included in cost of sales, other costs and expenses were $280,100,000 in 1993, $193,950,000 in 1992 and $183,350,000 in 1991 and included independent research and development, systems studies, other concept formulation studies and bid and proposal work related to government contract products and services.

Note Q:
Taxes on Income

Effective January 1, 1993, the Corporation adopted Statement of Financial Accounting Standard No. 109, "Accounting for Income Taxes" (FAS 109). The impact of adopting the standard on the Corporation's earnings and financial position was not material. Prior years' financial statements have not been restated to apply the provisions of FAS 109. Income taxes for 1992 and 1991 are based on pre-tax financial statement income in accordance with Accounting Principles Board Opinion No. 11.

(dollars)	1993	1992	1991
Federal income taxes:			
Current	$230,960	$135,340	$295,400
Deferred	11,900	9,800	(200,000)
Total federal income taxes	242,860	145,140	95,600
State income taxes:			
Current	25,480	19,820	49,480
Deferred	3,520	2,040	(37,380)
Total state income taxes	29,000	21,860	12,100
Foreign income taxes	3,140	—	—
Total income taxes provided	$275,000	$167,000	$107,700

The Corporation's effective income tax rate varied from the statutory United States income tax rate because of the following differences:

	1993	1992	1991
Statutory tax rate	35.0%	34.0%	34.0%
Increase (reduction) in tax rate from:			
Deferred tax reversal	—	(1.3)	(11.0)
Research and development credit	—	(.3)	—
Nondeductible amortization	1.4	—	—
State income taxes	2.6	2.8	1.9
Other items	(1.1)	(2.6)	.7
	2.9	(1.4)	(8.4)
Effective tax rate	37.9%	32.6%	25.6%

The Corporation's effective income tax rate was reduced in 1991 principally as a result of the reversal of deferred taxes associated with long-term contracts, previously provided at 46% or 40%, such rates being higher than the reduced statutory rates in effect since 1988.

The components of the provision for deferred income taxes for the years ended December 31, are as follows (add 000):	Liability Method	Deferred Method	Deferred Method
	1993	1992	1991
Deferral of profits on long-term contracts	$42,298	$ (1,660)	$(312,860)
Tax depreciation and amortization	1,948	(9,250)	(21,690)
Employee benefits	(63,513)	8,280	30,030
Financial reserves	47,084	13,170	(24,570)
Other items	(12,395)	1,280	1,210
	$15,420	$11,840	$(327,180)

Deferred federal and state tax provisions include the tax effects of financial reserves in 1993 for the ATARS reconnaissance system and reversals for the ADATS air defense system, International Light Metals and Commercial Titan; and in 1991 for International Light Metals and reversals for ADATS and Commercial Titan.

Deferred income taxes on the consolidated balance sheet reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The Corporation does not believe a valuation allowance is required.

The primary components of the Corporation's deferred tax assets and liabilities at December 31, 1993, were as follows:

Deferred Assets (Liabilities) (add 000)	
Deferral of profits on long-term contracts	$201,760
Property, plant and equipment and intangible assets	(387,228)
Employee benefits	350,226
Financial reserves	122,157
Other items	77,346
	$444,261

Profits on long-term contracts are reported on the completed contract method for contracts entered into prior to March 1, 1986, and on the percentage-of-completion capitalized cost method for contracts entered into after February 28, 1986. The amounts also include the effect of the tax deduction of certain costs in contracts-in-progress inventories.

Deferred income taxes relating to contracts are classified as current if the related contract is expected to be completed within the following year; otherwise, they are classified as noncurrent.

Income tax payments were $260,900,000 in 1993, $188,000,000 in 1992 and $376,500,000 in 1991.

Note R:
Industry Segments (millions)

	Assets Employed			Property Additions			Depreciation Depletion, Amortization		
	1993	1992	1991	1993	1992	1991	1993	1992	1991
Electronics	$2,948.7	$1,005.1	$1,105.1	$ 65.6	$ 61.0	$ 68.5	$146.4	$ 81.7	$ 79.0
Space	1,597.6	832.0	1,069.0	64.8	41.7	33.8	85.4	43.3	42.5
Information	1,161.9	270.6	305.9	22.9	18.9	47.4	51.6	42.3	48.5
Services	218.3	32.3	26.8	2.0	.8	1.6	3.2	.6	.5
Materials	463.7	418.7	393.1	54.4	49.5	46.1	34.4	39.8	39.7
Energy and Other	299.4	198.3	240.8	13.6	9.3	10.9	27.9	12.9	9.0
Total operating segments	6,689.6	2,760.0	3,139.7	223.3	181.2	217.3	348.9	220.6	219.2
Corporate	1,025.8	713.8	660.0	.1	.3	.8	1.1	5.5	5.9
Investments	29.5	125.8	108.3						
Total	$7,744.9	$3,599.6	$3,908.0	$223.4	$181.5	$218.1	$350.0	$226.1	$225.1

Description of Industry Segments: The Corporation operates in the following principal business segments:

Electronics Group is engaged in the design, development, engineering and production of high-performance electronic systems for undersea, shipboard, land-based and airborne applications. Major product lines include advanced technology missiles, night navigation and targeting systems for aircraft; submarine and surface ship combat systems; airborne, ship- and land-based radar; control systems; ordnance; and aircraft component manufacturing and assembly.

Space Group is engaged in the design, development, engineering and production of civil and military space launch vehicles, satellites, spacecraft and space- and ground-based strategic systems; surface- and space-based information and communications systems; and the Space Shuttle External Tank and associated electronics and instrumentation.

Information Group is engaged in the design, development, integration and operation of information systems, including simulation and automated test systems and image processing, for government and commercial applications.

Services Group provides technical and management services, including engineering, operation and maintenance of radar, telemetry communications and instrumentation systems, training and manufacturing assembly—for government and industry.

Materials Group comprises aggregate operations principally engaged in producing and selling crushed stone, sand and gravel, primarily for highways and general construction, and magnesia specialties operations, which produce and sell refractory materials and other magnesia products used in steel production, chemical processing purification and other industrial applications.

Energy and Other operations consist of the Corporation's activities associated with the U.S. Department of Energy research, fabrication, assembly and technology transfer operations; real estate subsidiaries in Florida and Maryland; research laboratories; International Light Metals from December 9, 1991, until August 31, 1992, when this business ceased operations; and other miscellaneous activities.

Corporate assets consist principally of cash and cash equivalents, deferred tax assets and general corporate properties and, in 1992 and 1991, benefit plan trusts.

The Corporation is the managing contractor for Department of Energy facilities in Tennessee, Kentucky, Ohio, Florida, New Mexico, California and New York. The contractual arrangements provide for the Corporation to be reimbursed for the cost of operations and receive a fee for performing management services. The Corporation reflects only the management fee in its sales and earnings for these government-owned facilities. In addition, applicable employee benefit plans are separate from the Corporation's.

Sales made directly or under subcontract to the U.S. Government amount to approximately $8.55 billion in 1993, $1.75 billion in 1992 and $1.89 billion in 1991 for Electronics; $3.20 billion in 1993, $3.04 billion in 1992 and $3.09 billion in 1991 for Space; $1.08 billion in 1993, $.36 billion in 1992 and $.39 billion in 1991 for Information; and $341 million in 1993, $65 million in 1992 and $42 million in 1991 for Services.

Goodwill and intangible amortization in 1993 was $35.8 million for Electronics, $19.8 million for Space, $19.9 million for Information, $3.7 million for Services and $2.6 million for Materials.

See page 61 of the Analysis of Financial Condition and Operating Results for sales and operating profit data for each reportable segment.

Report of Independent Auditors

Board of Directors and Shareowners
Martin Marietta Corporation:

We have audited the accompanying balance sheet of Martin Marietta Corporation and consolidated subsidiaries as of December 31, 1993 and 1992, and the related statements of earnings, shareowners' equity and cash flows for each of the three years in the period ended December 31, 1993. These financial statements are the responsibility of the Corporation's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Martin Marietta Corporation and consolidated subsidiaries at December 31, 1993 and 1992, and the consolidated results of their operations and their cash flows for each of the three years in the period ended December 31, 1993, in conformity with generally accepted accounting principles.

As discussed in Note M and Note Q to the consolidated financial statements, in 1993 the Corporation changed its method of accounting for post-retirement and post-employment benefits and income taxes.

Ernst & Young

Washington, D.C.
January 21, 1994

Statement of Financial Responsibility

Shareowners
Martin Marietta Corporation:

The management of Martin Marietta Corporation is responsible for the consolidated financial statements and all related financial information contained in this report. The financial statements, which include amounts based on estimates and judgments, have been prepared in accordance with generally accepted accounting principles applied on a consistent basis.

The Corporation maintains a system of internal accounting controls designed and intended to provide reasonable assurance that assets are safeguarded, that transactions are executed and recorded in accordance with management's authorization and that accountability for assets is maintained. An environment that establishes an appropriate level of control-consciousness is maintained and monitored and includes examinations by an internal audit staff and by the independent auditors in connection with their annual audit.

The Audit and Ethics Committee of the Board of Directors, which consists of eight outside directors, meets periodically and, when appropriate, separately with the independent auditors, management and the internal auditors to review the activities of each.

The financial statements have been audited by Ernst & Young, independent auditors, whose report appears on this page.

Marcus C. Bennett
Vice President and Chief Financial Officer

Analysis of Financial Condition and Operating Results

Martin Marietta c[illegible]d in excellent overall financial condition during 199[illegible] maintains adequate capital resources to operate, compete and grow in an increasingly challenging and competitive marketplace.

Financial results for 1993, which include the aerospace businesses of GE that were combined with Martin Marietta on April 2, 1993, produced earnings from operations of $788 million—a 44% increase over 1992—on sales of $9.4 billion and a year-end backlog of undelivered orders of $16.7 billion.

The Corporation's debt-to-capitalization ratio at December 31, 1993, was 30%, after absorbing a $1.4-billion increase in long-term debt associated with the GE Transaction and a $429-million after-tax charge resulting from the effects of certain changes in accounting adopted in 1993.

In July, the Board of Directors approved a two-for-one split of the Corporation's common stock (in the form of a stock dividend) and increased the dividend rate on common stock by 12 cents, or 7.1%, on a pre-split, annualized basis. Both actions were effective in the third quarter of 1993.

The Corporation's 1993 after-tax earnings increased 30% from 1992, excluding changes in accounting. Fully diluted earnings per share for the year, before the effect of the accounting changes, were $3.80, up from the split-adjusted $3.60 reported for 1992. These increases in earnings and earnings per share were achieved despite a significant increase in the Corporation's effective income tax rate in 1993. The average number of shares also increased significantly in 1993, reflecting the effect of the convertible preferred stock issued in connection with the GE Transaction. Martin Marietta's return on average shareowners' equity for 1993 was 15%. At year-end, total shareowners' equity reached a record $2.9 billion.

Conforming with the Corporation's acquisition strategy in aerospace and defense-related businesses, the Corporation signed an agreement in December 1993 to purchase the Space Systems Division of General Dynamics Corporation. This would allow the Corporation to enter the intermediate-lift space launch vehicle market with the Atlas series of launch vehicles. The acquisition is subject to certain regulatory approvals and the satisfaction of certain other conditions, and is expected to close during the first half of 1994. It will be accounted for under the purchase method of accounting. Operating results will be included with those of the Corporation effective upon the closing date.

In December 1993, Martin Marietta Materials, Inc., a wholly owned subsidiary of Martin Marietta Technologies, Inc., filed a registration statement with the Securities and Exchange Commission for an underwritten public offering of Martin Marietta Materials' common stock. The proposed offering will consist of 7,650,000 shares plus a 30-day over-allotment option for the underwriters to purchase up to

1,147,500 additional shares. The initial public offering by Martin Marietta Materials is dependent upon market conditions, but is expected in February 1994, after which the Corporation will own approximately 85% of the outstanding stock of the company, or 81% if the overallotment is exercised.

Business Environment

Martin Marietta's major business units principally serve government and commercial customers in the aerospace and defense markets. These business units also serve military and civil government customers as well as commercial customers in the information, communications, construction aggregates and specialty chemical businesses. Like many other businesses, Martin Marietta's markets are increasingly affected by global and regional economic and political cycles. In addition to these general marketplace conditions, the Corporation's major business units also are affected by the unique characteristics of the defense and aerospace industries.

The Corporation's defense and aerospace businesses are intensely competitive and are subject to uncertainties, including those resulting from changes in federal budget priorities, particularly the size and scope of the national defense and space budgets. However, Martin Marietta's broadly diversified programs and emphasis on high-priority programs and systems lessens somewhat the Corporation's exposure to continued defense- and space-related spending reductions. Defense budgets have been declining since the mid- to late-1980s, and this general market decline and concomitant increased competition within the defense and aerospace industries are expected to continue over the next few years. Continued uncertainty exists over the size and scope of future defense and space budgets and the resulting impact on specific programs. Consequently, some of the Corporation's products and programs have been subject to stretch-out, curtailment or termination. Additionally, since details of the fiscal year 1995 defense and space budgets are not known, ultimate spending reductions and funding limitations could result in cancellations, deferments or delays in existing or emerging programs.

Aerospace and defense businesses also have been adversely affected by Department of Defense procurement methods over the past several years. In addition to increased requirements for fixed-price development contracting, defense contractors have been required to make greater investments in certain new programs, the recoverability of which is sometimes dependent upon future orders or the exercise of negotiated production options. As a result, the Corporation's financial statements reflect an increased demand on working capital. However, the Department of Defense recently reversed these policies, and new contracts are beginning to reflect these changes. Changes in federal income tax laws have also increased tax rates and accelerated cash payments for taxes relating to long-term contracts. It should be noted that, recently, contract progress payment rates have been decreased.

In September 1993, the Corporation announced a facilities consolidation plan that is expected to reduce operating costs by $1.5 billion over the next five years. Management believes the restructuring plan will enhance the Corporation's ability to remain competitive and better serve its customers. Under the plan, approximately five million square feet of capacity will be eliminated at facilities in various locations. The consolidation plan, which focuses on facilities, is concurrent with ongoing actions addressing employment levels. The estimated cost of restructuring and integrating the former GE Aerospace operations into the Corporation was recognized as part of the purchase price allocation (see Business Combination with GE Aerospace on page 58). The $80-million estimated cost of the Corporation's restructure plans that does not relate to the assets acquired in the GE Transaction was charged to operating earnings in 1993.

Certain of Martin Marietta's current U.S. Air Force launch vehicle contracts contain mission success incentive provisions that could have a significant effect on the future profitability of these programs. The provisions enable the Corporation to earn significant fees for successful flights, but also significantly reduce fee availability in the event of unsuccessful missions. Additionally, the terms of certain of the Corporation's Department of Energy contracts provide the opportunity to increase significantly the fee earned by the Corporation based upon its performance and, at the same time, provide for the Corporation's assumption of a significantly higher level of accountability for its activities in managing Department of Energy facilities.

As a U.S. Government contractor, Martin Marietta's government contracts and operations are subject to government investigations. The government may investigate and make inquiries of the Corporation's business practices and conduct audits of contract performance and cost classification. These investigations may lead to claims which have been or may be asserted against the Corporation. Under U.S. Government procurement regulations and practice, an indictment of a government contractor could result in the contractor being fined, suspended for a period of time from eligibility for bidding on, or for award of, new government contracts; a conviction could result in debarment for a specified term from government contracts. Although the outcome of such investigations and inquiries cannot be predicted, in the opinion of management there are no claims, audits or investigations pending against the Corporation that are likely to have a material adverse effect on either the Corporation's business or its consolidated financial position or results of operations.

Martin Marietta's expanding participation in civil and commercial markets is affected in part by slow economic growth, as well as pressures to reduce public sector spending levels. The Corporation's construction aggregates business is sensitive to regional economic conditions and to cyclical swings in construction spending and changes in levels of federal and state governments' infrastructure-related spending. The Corporation's aggregates markets are concentrated princi-

gally in the Southeast and Midwest and [illegible] before are dependent upon the economies of those r[illegible]. During 1993, those regions experienced economic growth rates above the national average; however, there can be no assurance that this trend will continue. Although shipments in the Midwest region were adversely affected during the year by severe rains and flooding, the Corporation anticipates that shipments will increase with the rebuilding of flood-damaged areas. The Corporation continues to take advantage of strategic acquisition opportunities that may arise in the construction aggregates industry.

The Corporation is involved in environmental clean-up matters, including matters at various sites where it has been designated a Potentially Responsible Party (PRP) by the U.S. Environmental Protection Agency. In the event the Corporation is ultimately found to have liability at those sites where it has been designated a PRP, while the Corporation is jointly and severally liable with the other PRP's and, therefore, strictly liable for the entire cost of remediation, it anticipates that the actual burden for the costs of remediation will be shared with other PRPs. Additionally, the Corporation's insurers that provided liability coverage for environmental matters during relevant periods are participating in the Corporation's efforts under a reservation of rights. The nature of these environmental matters makes it difficult to estimate the timing and amount of any future costs that may be necessary for remedial measures.

The Corporation currently is unable to predict the outcome of these matters, inasmuch as the actual costs of remedial actions have not been determined and the allocation of liabilities among parties that ultimately may be found liable remains uncertain. The Corporation records appropriate financial statement accruals for environmental issues in the period in which liability is established and the amounts can reasonably be estimated. The Corporation's accrued liability was approximately $50 million at December 31, 1993. Management believes, however, that it is unlikely that any additional liability it may incur for known environmental issues would have a material adverse effect on its consolidated financial position or results of operations.

The consolidated financial statements and related information on pages 40 through 54 should be read in conjunction with the following review.

Business Combination With GE Aerospace

On November 22, 1992, Martin Marietta Corporation entered into a Transaction Agreement with General Electric Company (GE) to combine the aerospace and certain other businesses of GE (collectively the "GE Aerospace businesses") with the businesses of Martin Marietta Corporation in the form of affiliated corporations. The transaction (the "GE Transaction") was consummated on April 2, 1993.

The exchange consideration for the GE Transaction consisted of cash, preferred stock, retention by GE of certain accounts receivable and the assumption of payment obligations related to certain indebtedness. The GE Transaction has been acc[illegible] for under the purchase method of accounting, wherein approximately $1.9 billion in goodwill was recognized by the Corporation after recording approximately $700 million in other intangibles (representing the estimated fair market value of certain assets) and other purchase adjustments necessary to allocate the purchase price to the value of assets acquired and liabilities assumed. Goodwill is being amortized over a 40-year period, and the other intangibles are being amortized over a 15-year period.

Liquidity and Capital

At December 31, 1993, net working capital stood at $688 million and shareowners' equity had increased to a record $2.9 billion, reflecting the issuance of $1 billion in preferred stock in connection with the GE Transaction and absorption of a $429 million after-tax charge during the year from the changes in accounting for post-retirement and post-employment benefits. In April 1993, the Corporation assumed approximately $750 million of payment obligations (including approximately $16 million of accrued interest) as part of the GE Transaction and issued $700 million of long-term debt. Long-term debt was $1.8 billion at year-end, and the ratio of long-term debt to total capitalization was 39% at December 31, 1993, compared with 20% a year earlier. The 39%-debt-to-capitalization ratio at year-end was down from the 44% ratio that reflected the consummation of the GE Transaction.

Net cash flow provided by operating activities was $640 million in 1993, $678 million in 1992 and $179 million in 1991. The 1993 cash flow was principally from earnings before deducting non-cash charges for depreciation, amortization and accounting changes, net of income tax payments of $201 million made during the year. The cash flow from operating activities in 1992 was principally from earnings, depreciation and decreases in receivables and inventories, net of changes in Commercial Titan deferred revenue and $188 million in income tax payments made during the year. The 1991 cash flow was principally from earnings and depreciation, net of increased demand for working capital and income tax payments of $377 million.

Net capital expenditures were $245 million in 1993, $171 million in 1992 and $212 million in 1991. In December 1993, the Board of Directors approved new capital authorizations of $221 million.

Net cash consideration of $880 million was paid to GE in connection with the GE Transaction. Cash flow of $109 million was generated primarily from the sale of the majority of the Corporation's portfolio of marketable investment securities. In December 1993, the Corporation defeased in substance $103 million of payment obligations assumed in connection with the GE Transaction.

Capital Structure and Resources

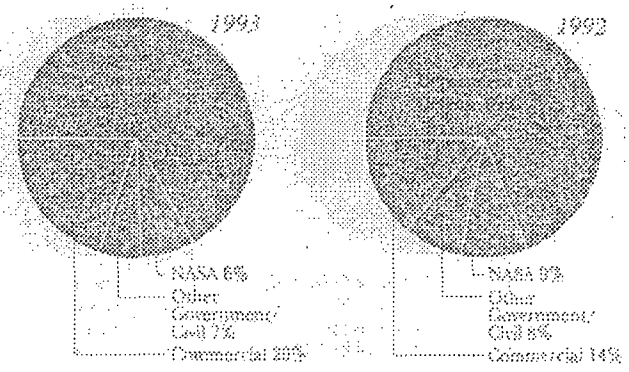
The GE Transaction had a significant impact on the capital structure and resources of the Corporation in 1993. In addition to the issuance of $1 billion of convertible preferred stock, the Corporation added $1.4 billion of long-term debt and replaced its previous credit facility with two new facilities.

Martin Marietta's internal cash flow and access to capital markets are expected to continue to be sufficient to provide the capital resources necessary to support operating needs and cover debt service requirements. The Corporation's senior debt (which is issued through Martin Marietta Technologies, Inc. and guaranteed by Martin Marietta Corporation) is rated A by Standard & Poor's, A2 by Moody's and A by Duff & Phelps. Martin Marietta's commercial paper is rated A-1 by Standard & Poor's, P-2 by Moody's and Duff-1 by Duff & Phelps.

Upon consummation of the GE Transaction, Martin Marietta Technologies, Inc., a wholly owned subsidiary, and Martin Marietta Corporation replaced a previous credit facility with a $900-million, 364-day revolving credit facility expiring on March 30, 1994, and a three-year revolving credit facility in the amount of $1.3 billion expiring on March 31, 1996. These borrowing facilities may be used for general corporate purposes. The Corporation borrowed $500 million under the three-year credit facility to partially finance the GE Transaction at closing. The $500 million was subsequently repaid and has been replaced by long-term debt securities issued to the public in April 1993. Effective September 1, 1993, Martin Marietta Technologies, Inc. permanently reduced the amounts committed under the facilities. The $900-million credit facility was reduced to $500 million, and the $1.3-billion facility was reduced to $850 million. At December 31, 1993, no amounts were outstanding under either credit facility. Martin Marietta Technologies has a shelf registration on file with the Securities and Exchange Commission for offering up to $300 million of debt securities, which may be issued from time to time. Such debt securities would be obligations of Martin Marietta Technologies, Inc., that would be fully and unconditionally guaranteed by Martin Marietta Corporation. The Corporation's ability to issue such debt securities at any time is dependent, among other things, upon market conditions.

Under a 1993 authorization from the Board of Directors, the Corporation may repurchase approximately 32.4 million shares, on a post-split basis, for use in connection with the Corporation's Amended Omnibus Securities Award Plan, Performance Sharing Plan and for general corporate purposes. No shares were repurchased by the Corporation during 1993.

Sales by Customer



Reported backlog at December 31, 1993, does not include approximately $3.7 billion of negotiated and priced, but unexercised, production options for certain of the Corporation's major aerostructure and satellite contracts and for various electronics, space, information and services programs. The exercise of these options is at the discretion of the customer and, in the case of U.S. Government contracts, dependent on future government funding.

Reported backlog also does not include approximately $12 billion in equivalent sales under the Corporation's Department of Energy management and operations contracts, since the management fee earned is the only item reflected in the consolidated financial statements. The underlying incurred costs associated with operating these Department of Energy facilities are not reflected in any way in the Corporation's reported sales. Martin Marietta has contracts to manage Department of Energy facilities in Tennessee, Kentucky, Ohio, Florida, New Mexico, California and New York. Management fees earned with respect to Department of Energy management and operations contracts are reflected with the Corporation's "Energy and Other" activities for segment reporting purposes.

Backlog

The Corporation's firm backlog of undelivered orders was $16.7 billion at December 31, 1993, compared with $6.9 billion at December 31, 1992, and $11.0 billion at December 31, 1991. Approximately 38% of the undelivered orders at December 31, 1993, are expected to be filled within one year.

New Accounting Standards

The Corporation adopted Statement of Financial Accounting Standards No. 106, "Employers Accounting for Post-retirement Benefits Other Than Pensions" (FAS 106), effective January 1, 1993. FAS 106 requires that the cost of certain post-retirement benefits be recognized under an accrual method of accounting instead of the prior practice of expensing the cost of such benefits as paid. The Corporation elected to expense the liability accumulated through 1992 due to the change in accounting method. This one-time transition obligation of $666 million resulted in an after-tax charge to net income of $412 million in the first quarter of 1993.

The Corporation elected to adopt Statement of Financial Accounting Standards No. 112, "Employers Accounting for Post-employment Benefits" (FAS 112). FAS 112 mandates that the cost of certain post-employment benefits be recognized under an accrual method of accounting instead of the different practice of expensing the cost of such benefits as paid. The effect of this change in accounting method

resulted in a one-time, after-tax charge to income of $17 million.

Effective January 1, 1993, the Corporation adopted Statement of Financial Accounting Standards No. 109, "Accounting for Income Taxes" (FAS 109). The impact of adopting the standard on the Corporation's earnings and financial position was not material. Prior years' financial statements have not been restated to apply the provisions of FAS 109. Income taxes for 1992 and 1991 are based on pre-tax financial statement income in accordance with Accounting Principles Board Opinion No. 11.

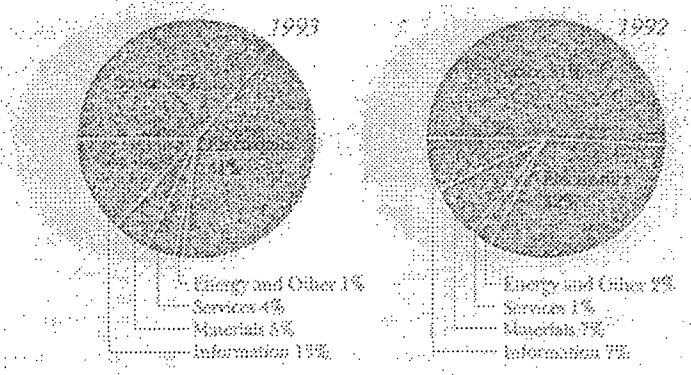
Results of Operations

Net sales were approximately $9.4 billion in 1993 and $6.0 billion in 1992. Net sales increased $3.48 billion, or 58%, in 1993 and declined $121 million, or 2%, in 1992. Net sales for 1993 include sales of the former GE Aerospace businesses that were combined with Martin Marietta Corporation in April 1993.

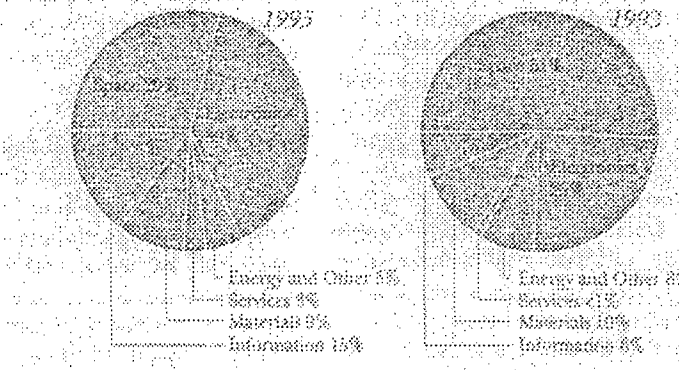
The Electronics Group had 1993 sales of $3.9 billion, which were $2.0 billion, or 106%, higher than in 1992. Sales in 1992 were $235 million, or 11% lower, than in the previous year. The 1993 gains reflect the performance of Ocean, Radar & Sensor Systems, Government Electronic Systems and Defense Systems. The sales performance of these units was reduced by sales declines from Postal Systems and the Group's LANTIRN targeting and navigation system. In 1992, sales gains from Postal Systems and Aero & Naval Systems were offset by a 20% decline in Electronics & Missiles sales. This decline was principally due to a decrease in LANTIRN sales.

The Space Group, with 1993 sales of $3.4 billion, had a sales increase of $387 million, or 13%, in 1993, after a decline of $49 million, or 2%, in 1992. The Air Force Titan IV program, which had a sales increase of 7% in 1993 after declining 6% in 1992, was the principal contributor to the Group's total sales and earnings in both years. The $11.8-billion Titan IV fixed-price-incentive program is the Corporation's largest and contributed 1993 sales of $1.56 billion. In 1993, sales from the Group's Astro Space unit more than offset anticipated revenue declines on the External Tank program, the completed Commercial Titan program and several other space launch programs.

Contribution to Sales



Contribution to Operating Profit



The Information Group had 1993 sales of $1.4 billion, which were $775 million, or 120%, higher than in 1992. Sales in 1992 were $38 million, or 7%, greater than in 1991. Sales from the Group's Management & Data Systems and Automated Systems units were the principal reason for the sales gains in 1993; the sales increase in 1992 was principally from the Information Systems unit.

Services Group sales increased $378 million in 1993 and $25 million in 1992. The large increase in 1993 is primarily attributable to sales from Martin Marietta Services, Inc., included in the Group's results from April 2, 1993.

Materials Group sales increased by 11% in 1993 and 10% in 1992, mainly from sales of construction aggregates, which grew 16% in 1993 and 12% in 1992. Aggregates' sales performance reflects improvements in construction markets and increased production capacity resulting from acquisitions and new production facilities.

Electronics Group operating profits increased 126% in 1993 and decreased 20% in 1992. The gains in 1993 reflect principally the performance of Ocean, Radar & Sensor Systems, Government Electronic Systems and Defense Systems. The decline in 1992 is due to reduced LANTIRN program activities and to recognition of estimated losses and program investments in Postal Systems that offset improved Aero & Naval Systems earnings.

Operating profits for the Space Group decreased 13% in 1993 and increased 7% in 1992. In 1993, lower Titan IV and External Tank program profits were partially offset by Astro Space earnings. During 1993, Martin Marietta's Space Group suffered the failure of three satellites and a Titan IV launch vehicle. Following a Martin Marietta-sponsored investigation, the Space Group established a formal Mission Assurance program. Through this program, the Space Group is strengthening its systems engineering, establishing formal Mission Success offices within all of its operating units, expanding its product integrity engineering system and increasing employee training. The failures did not result in a material adverse impact on the Corporation's financial position or results of operations as of and for the year ended December 31, 1993. This Group's gains in 1992 reflect a 25% growth in profits on the Air Force Titan IV program and include recognition of mission success incentives on that program.

Net Sales and Operating Profit
By Industry Segments
(millions)

	Net Sales			Operating Profit		
	1993	1992	1991	1993	1992	1991
Electronics	$3,930.5	$1,905.0	$2,140.8	$333.5	$147.3	$183.8
Space	3,441.7	3,054.8	3,103.6	249.3	304.1	285.0
Information	1,891.6	617.0	579.2	127.1	54.0	43.7
Services	458.2	80.3	65.5	28.5	2.2	(2.1)
Materials	452.9	408.8	371.7	77.3	58.0	52.7
Energy and Other	117.4	121.5	70.9	42.6	45.0	33.3
	9,792.3	6,187.4	6,327.7	858.3	591.2	596.4
Intersegment sales	(356.8)	(253.1)	(252.3)			
Total operating segments	$9,435.7	$5,954.3	$6,075.4			
Corporate				(91.3)	(25.8)	(34.2)
Investments				8.5	4.9	(83.7)
Interest expense				(110.2)	(57.9)	(57.7)
Earnings before Taxes on Income and Cumulative Effect of Accounting Changes				$725.3	$512.4	$420.8

Information Group operating profits increased $93 million, or 274%, in 1993 after declining by $10 million in 1992. Earnings from Management & Data Systems and Automated Systems were the primary reasons for the 1993 gains. Services Group operating profits rose $26 million in 1993 and $4 million in 1992.

Materials Group operating profits increased 32% in 1993 and 11% in 1992, principally due to its aggregates operations. Aggregates profits rose 30% in 1993 and 20% in 1992. These gains were due to improvements in construction markets and increased output from acquisitions and new production facilities.

Other income and expenses, net (see page 40) increased $26 million in 1993 and $80 million in 1992. The increase in 1993 is principally attributable to higher royalty income earned in 1993 versus 1992. In 1991, other income and expenses included a $70-million pre-tax charge ($59 million after-tax, or 39 cents per share) in connection with restructuring the Corporation's International Light Metals operation and $17 million of equity losses representing the Corporation's share of losses incurred by that operation, which is now closed.

Interest expense on debt rose $52 million, or 90%, in 1993, after remaining essentially flat between 1992 and 1991. The increase in 1993 was due to the $1.4-billion increase in long-term debt during the second quarter of 1993. The Corporation issued $700 million in long-term debt in April 1993, and assumed $730 million of GE payment obligations (including approximately $16 million of accrued interest) in connection with the GE Transaction. In 1992, lower interest expense on the Corporation's Adjustable Rate Note issue, which was partially redeemed on May 1, 1992, was offset by the full-year interest on the $200 million of notes issued by the Corporation in March 1991.

The effective income tax rate for 1993 was 37.9%, compared with 32.6% in 1992 and 25.6% in 1991. On August 10, 1993, the Omnibus Budget Reconciliation Act of 1993 increased the corporate federal income tax rate from 34% to 35%, effective January 1, 1993; its impact was reflected in the Corporation's third quarter results. The Corporation's effective income tax rate for 1993 is higher than the current corporate federal income tax rate of 35% due to differences between book and tax accounting arising from the amortization of goodwill associated with the GE Transaction and state income taxes. The effective income tax rates varied from the statutory rate in 1991 principally as a result of the reversal of deferred taxes associated with long-term contracts previously provided at rates higher than statutory rates in effect since 1986.

The sum of per-share earnings, assuming full dilution, by quarter does not equal earnings per share for the year ended December 31, 1993, because the average number of shares outstanding increased during the second quarter of 1993 as a result of the assumed conversion of the convertible Series A preferred stock.

The sum of per-share earnings by quarter does not equal earnings per share for the year ended December 31, 1992, due to the effect of share repurchases during 1992.

The impact of inflation has become less significant with lower inflation rates in recent years. When the Corporation incurs higher costs to replace productive facilities, increased depreciation generally is countered by increased productivity, increased selling prices and other offsetting factors.

Quarterly Performance

(Unaudited)

(millions, except per share)

Quarter	Net Sales		Earnings from Operations		Earnings before Cumulative Effect of Accounting Changes		Net Earnings (Loss)	
	1993	1992	1993	1992	1993	1992	1993†	1992
First	$1,168.6	$1,371.5	$124.6	$130.9	$ 76.4	$ 74.6	$(353.0)	$ 74.6
Second	2,613.3	1,584.4	222.1	157.3	134.1	99.0	134.1	99.0
Third	2,466.1	1,548.8	223.0	147.1	131.1	96.1	131.1	96.1
Fourth	3,187.7	1,449.6	218.2	125.9	118.7	75.7	118.7	75.7
Year	$9,435.7	$5,954.3	$788.5	$540.2	$450.3	$345.4	$ 30.9	$345.4

Quarter	Earnings Per Common Share before Cumulative Effect of Accounting Changes, Assuming Full Dilution		Common Dividends Paid and Stock Prices					
			Dividends Paid		Market Price High		Market Price Low	
	1993†	1992	1993	1992	1993		1992	
First	$ .81	$ .76	$ .21	$ .1875	$37.44	$32.00	$29.75	$25.00
Second	.99	1.03	.21	.1875	39.94	33.81	27.44	24.94
Third	1.04	1.02	.225	.21	44.875	38.06	29.31	25.55
Fourth	.94	.81	.225	.21	46.625	40.375	35.25	27.75
Year	$3.80*	$3.60**	$ .87	$ .795				

† First quarter 1993 earnings have been restated from the amounts originally reported to reflect the Corporation's adoption in 1993 of Statement of Financial Accounting Standards No. 112, "Employers Accounting for Post-employment Benefits." The after-tax charge for the change in accounting for post-employment benefits was $17.1 million or 18 cents per common share. The loss per common share from the changes in accounting for post-retirement benefits and post-employment benefits was $4.55 in the first quarter of 1993 and $4.37 for the full year.

* The sum of per-share earnings by quarter does not equal earnings per share for the year because the average number of shares outstanding increased during the second quarter of 1993 as a result of the assumed conversion of the convertible Series A preferred stock.

** The sum of per-share earnings by quarter does not equal earnings per share for the year due to the effect of share repurchases.

Five Year Summary

(add 000, except per share)	1993	1992	1991	1990	1989
Operating Results					
Net sales	$9,435,689	$5,954,292	$6,075,415	$6,125,939	$5,796,152
Cost of sales, other costs and expenses	8,647,224	5,405,123	5,597,926	5,683,462	5,331,544
Earnings from Operations	788,465	549,169	587,489	442,477	464,608
Other income and expenses, net	46,997	21,144	(58,980)	34,504	7,799
	835,462	570,313	478,509	476,981	472,427
Interest expense on debt	110,173	57,890	57,660	41,790	43,084
Earnings before taxes on income and cumulative effect of accounting changes	725,289	512,423	420,849	435,191	429,343
Taxes on income	275,000	167,000	107,700	107,600	122,400
Earnings before Cumulative Effect of Accounting Changes	450,289	345,423	313,149	327,591	306,943
Cumulative effect of changes in accounting for post-retirement benefits other than pensions and for post-employment benefits	(429,432)	----	----	----	----
Net Earnings	$ 20,857	$ 345,423	$ 313,149	$ 327,591	$ 306,943
Per Common Share					
Net earnings (loss)					
Assuming no dilution:					
Before cumulative effect of accounting changes	$4.25	$3.60	$3.15	$3.26	$2.91
Cumulative effect of accounting changes	(4.51)	----	----	----	----
	$ (.26)	$3.60	$3.15	$3.26	$2.91
Assuming full dilution:					
Before cumulative effect of accounting changes	$3.80	$3.60	$3.15	$3.26	$2.91
Cumulative effect of accounting changes	*	----	----	----	----
	*	$3.60	$3.15	$3.26	$2.91
Cash Dividends	$ .87	$.795	$ .75	$.69875	$.6125

*Anti-dilutive

Condensed Balance Sheet Data					
Current assets	$2,448,240	$1,454,841	$1,627,649	$1,400,617	$1,440,605
Other noncurrent assets	707,772	809,445	947,418	760,441	663,150
Noncurrent deferred income taxes	206,119	----	----	----	----
Property, plant and equipment, net	1,692,753	1,257,139	1,315,472	1,340,688	1,300,959
Cost in excess of net assets acquired	1,914,894	26,224	22,099	24,061	20,168
Other intangibles	775,113	81,456	94,594	84,722	80,517
Total	$7,744,891	$3,599,605	$3,908,032	$3,610,529	$3,805,379
Current liabilities—other	$1,491,591	$ 682,422	$ 884,340	$ 988,456	$ 922,148
Current maturities of long-term debt	318,525	3,814	74,908	5,191	4,179
Long-term debt	1,479,571	474,726	595,042	463,288	477,504
Post-retirement benefits	749,630	101,978	99,281	55,253	----
Other noncurrent liabilities	838,252	194,195	202,300	299,820	282,933
Noncurrent deferred income taxes	----	297,254	247,458	257,558	314,555
Shareowners' equity	2,876,352	1,045,216	1,803,903	1,540,963	1,354,960
Total	$7,744,891	$3,599,605	$3,908,032	$3,610,529	$3,805,379

Board of Directors

Norman R. Augustine
Chairman and Chief Executive Officer,
Martin Marietta Corporation

Lamar Alexander
Baker, Worthington, Crossley, Stansberry & Woolf
(attorneys)

Marcus C. Bennett
Vice President and Chief Financial Officer,
Martin Marietta Corporation

John J. Byrne
Chairman and Chief Executive Officer,
Fund American Enterprises Holdings, Inc.
(property and casualty insurance)

A. James Clark
Chairman and President, Clark Enterprises, Inc.
(multi-unit construction company)

Edwin I. Colodny
Of Counsel, Paul, Hastings, Janofsky & Walker
(attorneys)

James L. Everett, III
Retired Chairman, Philadelphia Electric Company
(public utility)

Edward L. Hennessy, Jr.
Retired Chairman, AlliedSignal, Inc.
(diversified manufacturer)

Edward E. Hood, Jr.
Retired Vice Chairman, General Electric Company
(diversified manufacturer)

Caleb B. Hurtt
Retired President and Chief Operating Officer,
Martin Marietta Corporation

Gwendolyn S. King
Senior Vice President, Philadelphia Electric Company
(public utility)

Melvin R. Laird
Senior Counselor, The Reader's Digest Association, Inc.
(publishing)

Gordon S. Macklin
Retired Chairman, Hambrecht & Quist, Inc.
(investment banking)

Eugene F. Murphy
President and Chief Executive Officer,
GE Aircraft Engines
(diversified manufacturer)

Allen E. Murray
Chairman and Chief Executive Officer,
Mobil Corporation
(petroleum, petrochemical and plastic products)

John W. Vessey, Jr.
Retired Chairman of the Joint Chiefs of Staff

A. Thomas Young
President and Chief Operating Officer,
Martin Marietta Corporation

Audit and Ethics Committee
Mr. Macklin, Chairman;
Mrs. King, Messrs. Alexander, Everett, Hood,
Laird, Murray and Vessey.

Compensation Committee
Mr. Murray, Chairman;
Messrs. Alexander, Clark, Everett, Hennessy,
Hurtt and Murphy.

Executive Committee
Mr. Augustine, Chairman;
Messrs. Clark, Colodny, Hood, Hurtt, Laird,
Macklin, Vessey and Young.

Finance Committee
Mr. Byrne, Chairman;
Mrs. King, Messrs. Clark, Colodny, Hood, Hurtt,
Macklin and Murphy.

Nominating Committee
Mr. Everett, Chairman;
Messrs. Byrne, Colodny, Hennessy,
Laird and Vessey.

Officers

Norman R. Augustine
Chairman and Chief Executive Officer

A. Thomas Young
President and Chief Operating Officer

Marcus C. Bennett
Vice President and Chief Financial Officer

Richard G. Adamson
Vice President

Joseph D. Antinucci
Vice President

Peter A. Bracken
Vice President

Michael F. Camardo
Vice President

Thomas A. Corcoran
Vice President

James B. Feller
Vice President

Clyde C. Hopkins
Vice President

Alexander L. Horvath
Vice President

Bobby F. Leonard
Vice President

William B. Lytton
Vice President

James W. McAnally
Vice President

Frank H. Menaker, Jr.
Vice President and General Counsel

Dan A. Peterson
Vice President

Robert J. Pohuchko
Vice President

Michael A. Smith
Vice President

Peter B. Teets
Vice President

Robert W. Tieken
Vice President

Stephen P. Zelnak, Jr.
Vice President

Janet L. McGregor
Treasurer

Lillian M. Trippett
Secretary

Stockholder Information

Notice of Proxy
A formal notice of the Annual Meeting of stockholders of the Corporation, together with a proxy, will be mailed to each stockholder approximately four weeks prior to the meeting. Proxies will be requested by the Board of Directors at the meeting.

Form 10-K
The Corporation's Annual Report on Form 10-K, filed with the Securities and Exchange Commission is available upon written request to the Investor Relations Office, 6801 Rockledge Drive, Bethesda, Maryland 20817.

Transfer Agent & Registrar
First Chicago Trust Company of New York
P.O. Box 2500
Jersey City, New Jersey 07303-2500
Telephone: (201)324-0137

Inquiries regarding your account records, issuance of stock certificates, distribution of dividends and IRS Form 1099 should be directed to First Chicago Trust Company of New York.

Dividend Reinvestment Plan
Martin Marietta's Dividend Reinvestment and Stock Purchase Plan offers stockholders an opportunity to purchase additional shares through automatic dividend reinvestment and/or voluntary cash investments. For more information, contact our transfer agent, First Chicago Trust Company of New York.

Listings
Chicago Stock Exchange
New York Stock Exchange
Pacific Stock Exchange
Philadelphia Stock Exchange

Ticker Symbol: **ML**
Newspapers: **MartM** or **MartMar**

Independent Auditors
Ernst & Young

Executive Offices
6801 Rockledge Drive
Bethesda, Maryland 20817
Telephone: (301) 897-6000

Investor Relations
Telephone: (301) 897-6303

Principal Elements

Martin Marietta Electronics Group
Bethesda, MD
Thomas A. Corcoran, President

Martin Marietta Aero & Naval Systems
Baltimore, MD
Dr. William F. Ballhaus, President

Martin Marietta Armament Systems
Burlington, VT
Kenneth J. Leenstra, General Manager

Martin Marietta Communications Systems
Camden, NJ
Gregory B. Roberts, Vice President

Martin Marietta Control Systems
Binghamton, NY
James D. Scanlon, General Manager

Martin Marietta Defense Systems
Pittsfield, MA
Stephen Pavlosky, President

Martin Marietta Electronics & Missiles
Orlando, FL
Joseph D. Antinucci, President

Martin Marietta Government Electronic Systems
Moorestown, NJ
Joseph T. Threston, Vice President

Martin Marietta Ocean, Radar & Sensor Systems
Syracuse, NY
Dr. Alexander L. Horvath, President

Martin Marietta Information Group
Bethesda, MD
Peter A. Bracken, President

Martin Marietta Automation Systems
Daytona Beach, FL
John Hallal, General Manager

Martin Marietta Information Systems
Bethesda, MD
Gary P. Mann,
Vice President & General Manager

Martin Marietta Internal Information Systems
Valley Forge, PA
Joseph R. Cleveland, General Manager

Martin Marietta Management & Data Systems
Valley Forge, PA
Kenneth R. Swimm, President

Martin Marietta Space Group
Bethesda, MD
Peter B. Teets, President

Martin Marietta Astronautics
Denver, CO
James W. McAnally, President

Martin Marietta Astro Space
East Windsor, NJ
Michael A. Smith, President

Martin Marietta Manned Space Systems
New Orleans, LA
Thomas C. Wirth, President

Martin Marietta Energy Group
Oak Ridge, TN
Clyde C. Hopkins, President

Martin Marietta Energy Systems
Oak Ridge, TN
Gordon G. Fee, President

Martin Marietta Specialty Components, Inc.
Largo, FL
Dr. Charles A. Hall, President

Martin Marietta Utility Services, Inc.
Oak Ridge, TN
Wendell E. Fields, Vice President

Martin Marietta Materials, Inc.
Raleigh, NC
Stephen P. Zelnak, Jr., President

Martin Marietta Aggregates
Raleigh, NC
Stephen P. Zelnak, Jr., President

Martin Marietta Magnesia Specialties, Inc.
Raleigh, NC
Philip J. Sipling, President

Sandia Corporation
Albuquerque, NM
Dr. Albert Narath, President

Martin Marietta Services Group
Cherry Hill, NJ
Michael F. Camardo, President

KAPL, Inc.
Schenectady, NY
John J. Freeh, President

Martin Marietta Assembly Services
Americus, GA
Donald E. Richardson, Plant Manager

Martin Marietta EPA National Computer Center
Research Triangle Park, NC
Thomas B. Shafer, Vice President

Martin Marietta Field Services
Littleton, CO
Fred Lyssy, Director

Martin Marietta Fleet Combat System Services
Arlington, VA
Stanley J. Pryzby, Director

Martin Marietta Range Services
Colorado Springs, CO
Robert B. Alleger, Vice President

Martin Marietta Software Services
Baltimore, MD
Linda R. Renfro, Vice President

Martin Marietta Space & Aeronautic Services
Landover, MD
David J. Posek, Vice President

Martin Marietta Technical Support Services
Cherry Hill, NJ
Kenneth S. Morton, Vice President

Martin Marietta Technology
San Diego, CA
Robert J. Whalen, Vice President

Advanced Development Operations
San Diego, CA
Allan H. Wegner, Vice President

Martin Marietta Laboratories
Baltimore, MD
Ronald H. Schack, Vice President

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 11300
STATUS CODE: 2
FEE CATEGORY: 2C
EXP. DATE: 19890531
FEE COMMENTS: _____

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: GENERAL ELECTRIC CO.
RECEIVED DATE: 900727
DOCKET NO: 4007344
CONTROL NO.: 113058
LICENSE NO.: SUB-831
ACTION TYPE: AMENDMENT

2. FEE ATTACHED
AMOUNT: $0
CHECK NO.: 0

3. COMMENTS

SIGNED R. J. Brown
DATE 8/2/90

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /✓/)

1. FEE CATEGORY AND AMOUNT: 2C

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT ✓
RENEWAL _____
LICENSE _____

3. OTHER _____

SIGNED SK
DATE 10/29/90