DEC 28 1993

License No. 37-19533-01
47-00260-02
Docket No. 30-17840
30-06652
Control No: 113570

Union Carbide Chemical and
Plastics Company, Incorporated
ATTN: J. A. Clerico,
Vice President, Treasurer and
Chief Financial Officer
Old Ridgebury Road
Danbury, Connecticut 06817

Dear Mr. Clerico:

Subject: Financial Assurance

This is in reference to your letters to the USNRC Region I, dated October 29, 1990, May 13, 1991, September 14, 1992 and to your letter dated October 4, 1993 to Mr. Earl Wright of the USNRC, Region II as well as the attached Letter of Credit and Standby Trust Agreement to provide financial assurance for NRC License No's. 37-19533-01 and 47-00260-02. We have reviewed your submittal and within the scope of our review, no further deficiencies were identified.

Based on our review of your submittals, with regard to the above referenced licenses, you are now in compliance with the requirements of 10 CFR 30.35. Please note that financial assurance certification and all associated documentation are required to be updated with significant changes in your operations at either site and with each application for license renewal.

Thank you for your cooperation in this matter.

Sincerely,

Original Signed By:
Mohamed M. Shanbaky

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

cc:
Union Carbide Chemicals
and Plastics Company, Inc.
Bushy Run Research Center
ATTN: Joyce L. Beskitt
Radiation Safety Officer
6702 Mellon Road
Export, PA 15632-8902

Union Carbide Chemicals
and Plastics Company, Inc.
ATTN: Michael L. Green
Radiation Safety Officer
P.O. Box 8361
South Charleston, West Virginia 25303

bcc:
M. Shanbaky, RI
D. Everhart, RI
E. Wright, RII

DRSS:RI	DRSS:RI
Everhart\dbe	Shanbaky
	MS
12/27 /93	12/27/93

MS 16
K-2

UNION CARBIDE

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.
P.O. Box 8361
South Charleston, WV 25303

Mr. Earl Wright
US NRC, Region 2
101 Marietta Street, N.W.
Atlanta, GA 30323

October 4, 1993
Mail Control No. 113570
Lic. No. 47-00260-02

Dear Mr. Wright

As per communication from Mr. John D. Kinneman of September 21, 1993 we are requesting that our USNRC License Number 47-00260-2 be amended as follows.

Change Item 6 C. of the license from its current description to:

"Carbon-14 and/or Hydrogen-3"

Our intention in making this change is to put us into the $150,000 Financial Assurance for Decommissioning Category. If this change will not accomplish this objective, please notify me that I may work with you in achieving that goal. This more correctly reflects our current needs for radioisotope tracer materials.

At this time I would also like to replace Ms. C. B. McCorkle as the Purchasing Department Representative on our Radiation Safety Committee. Her replacement is Mr. Philip Johnson. His resume' is attached.

A check in the amount of $620.00 is enclosed for the fee for amending a category 3L license .

If you have any questions abcut this please call me at (304) 747-5314.

Yours truly,

Michael L. Green

Michael L. Green
Rad. Safety Officer

cc:
John D. Kinneman, Chief
Research & Development and Decommissioning Section
Division of Radiation Safety and Safeguards
US NRC, Region 1
475 Allendale Rd
King of Prussia PA 19406-1415

113570

SEP 21 1993

License No. 37-19533-01
47-00260-02
Docket No. 30-17840
30-06652
Control No. 113570

Union Carbide Chemical and
Plastics Company, Incorporated
ATTN: J. A. Clerico
Vice President, Treasurer and
Chief Financial Officer
Old Ridgebury Road
Danbury, Connecticut 06817

Dear Mr. Clerico:

Subject: Financial Assurance

This is in reference to your letter dated May 13, 1991 with attached Letter of Credit and Standby Trust Agreement to provide financial assurance for the Bushy Run Research Center in Export Pennsylvania and your Technical Center located in South Charleston, West Virginia. This also refers to your letter dated September 14, 1992 in response to a telephone conversation with Eric Reber of this office on August 6, 1992. In order to continue our review, we need the following additional information:

1. Schedule A to the Standby Trust Agreement attached to the May 13, 1991 letter states that the decommissioning cost estimate for the facilities at Bushy Run Research Center and at South Charleston, West Virginia equals $150,000 each for a total of $300,000. While $150,000 is the amount required by the NRC regulation for the possession limits for the Bushy Run Research Center, License No. 47-00260-02, authorizes the facility in South Charleston, West Virginia, to possess up to 1 curie total of any byproduct material, except alpha emitters, with atomic numbers 1-83 inclusive, in any chemical and/or physical form. This exceeds the applicable quantities in Appendix C to 10 CFR 20 by more than 10^5 for a number of isotopes.

   10 CFR 30.35(a) requires that licensees authorized to possess NRC licensed material in amounts exceeding 10^5 times the applicable quantities in Appendix C to 10 CFR 20, must submit a decommissioning funding plan (DFP) which includes an actual estimate

of the cost to decommission the facility or certification for at least $750,000. If the licensee submits certification for financial assurance in the amount of $750,000 without submitting a DFP, the licensee must include a DFP with their subsequent license renewal application. The application to renew License No. 47-00260-02 is due on or before February 18, 1995. You have the following options:

a. Submit a request to amend License No. 47-00260-02 to decrease the possession limit for NRC licensed material, so that financial assurance in the amount of $150,000 is sufficient (This request must be submitted to Region II in Atlanta, Georgia); or

b. Submit financial assurance certification for the correct amount for both facilities ($900,000); (This would be submitted to the Region I office in King of Prussia, Pennsylvania); or

c. Submit a DFP and actual cost estimate for one or both licenses and a financial assurance mechanism for the estimated amount. The appropriate level of detail for the cost estimate is discussed in Appendix F to Regulatory Guide 3.66(enclosed). The enclosed NUREG's may be helpful in preparing the estimate(s). Submit to the Region I office in King of Prussia, Pennsylvania, if you use the same mechanism for both licenses.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I office and refer to Mail Control No. 113570. If you have any questions regarding this letter please call David Everhart of my staff at (215) 337-6936.

Since your license requires financial assurance, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By:
John D. Kinneman

John D. Kinneman, Chief
Research & Development and
Decommissioning Section
Division of Radiation Safety
and Safeguards

MS 16
K-2

UNION CARBIDE

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.
P.O. Box 8361
South Charleston, WV 25303

Mr. Earl Wright
US NRC, Region 2
101 Marietta Street, N.W.
Atlanta, GA 30323

October 4, 1993
Mail Control No. 113570
Lic. No. 47-00260-02

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Yours truly,

Michael L. Green

Michael L. Green
Rad. Safety Officer

cc:
John D. Kinneman, Chief
Research & Development and Decommissioning Section
Division of Radiation Safety and Safeguards
US NRC, Region 1
475 Allendale Rd
King of Prussia PA 19406-1415

113570

PHILIP D. JOHNSON

Mr Philip Johnson has no formal training or experience with radioactive materials. His sole purpose for sitting on the committee is to provide a direct link between the Committee and the Purchasing Department. He has all responsibility for processing purchase orders for radioactive material controlled by this license

EDUCATION

West Virginia University, Morgantown, WV 26506
Bachelor of Science in Industrial Engineering
Date of Graduation: May 1990
Overall GPA: 3.3/4.0 Field GPA: 3.75/4.0

EMPLOYMENT

Purchasing Agent: Union Carbide Chemicals & Plastics Co., Inc., South Charleston, WV, August 1990 to present. Write purchase agreements and contracts for a variety of products and services.

HONORS

Alpha Pi Mu - Industrial Engineering Honor Society
Graduated Summa Cum Laude

SKILLS AND HOBBIES

Experience with personal computers and some programming languages (Basic, FORTRAN, GPSS and PL/I).

SEP 21 1993

License No. 37-19533-01
47-00260-02
Docket No. 30-17840
30-06652
Control No. 113570

Union Carbide Chemical and
Plastics Company, Incorporated
ATTN: J. A. Clerico
Vice President, Treasurer and
Chief Financial Officer
Old Ridgebury Road
Danbury, Connecticut 06817

Dear Mr. Clerico:

Subject: Financial Assurance

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1. Schedule A to the Standby Trust Agreement attached to the May 13, 1991 letter states that the decommissioning cost estimate fcr the facilities at Bushy Run Research Center and at South Charleston, West Virginia equals $150,000 each for a total of $300,000. While $150,000 is the amount required by the NRC regulation for the possession limits for the Bushy Run Research Center, License No. 47-00260-02, authorizes the facility in South Charleston, West Virginia, to possess up to 1 curie total of any byproduct material, except alpha emitters, with atomic numbers 1-83 inclusive, in any chemical and/or physical form. This exceeds the applicable quantities in Appendix C to 10 CFR 20 by more than 10^5 for a number of isotopes.

   10 CFR 30.35(a) requires that licensees authorized to possess NRC licensed material in amounts exceeding 10^5 times the applicable quantities in Appendix C to 10 CFR 20, must submit a decommissioning funding plan (DFP) which includes an actual estimate

of the cost to decommission the facility or certification for at least \$750,000. If the licensee submits certification for financial assurance in the amount of \$750,000 without submitting a DFP, the licensee must include a DFP with their subsequent license renewal application. The application to renew License No. 47-00260-02 is due on or before February 18, 1995. You have the following options:

a. Submit a request to amend License No. 47-00260-02 to decrease the possession limit for NRC licensed material, so that financial assurance in the amount of \$150,000 is sufficient (This request must be submitted to Region II in Atlanta, Georgia); or

b. Submit financial assurance certification for the correct amount for both facilities (\$900,000); (This would be submitted to the Region I office in King of Prussia, Pennsylvania); or

c. Submit a DFP and actual cost estimate for one or both licenses and a financial assurance mechanism for the estimated amount. The appropriate level of detail for the cost estimate is discussed in Appendix F to Regulatory Guide 3.66(enclosed). The enclosed NUREG's may be helpful in preparing the estimate(s). Submit to the Region I office in King of Prussia, Pennsylvania, if you use the same mechanism for both licenses.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I office and refer to Mail Control No. 113570. If you have any questions regarding this letter please call David Everhart of my staff at (215) 337-6936.

Since your license requires financial assurance, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By:
John D. Kinneman

John D. Kinneman, Chief
Research & Development and
Decommissioning Section
Division of Radiation Safety
and Safeguards

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

bcc: (w/enclosures)
J. Kinneman, RI
E. Wright, RII

DRSS:RI
Everhart\amw

9/21/93

DRSS:RI
Kinneman

9/21/93

MS 16
L-3

UNION CARBIDE

BUSHY RUN RESEARCH CENTER

6702 Mellon Road, Export, Pennsylvania 15632-8902

Telephone (412) 733-5200
Telecopier (412) 733-4804

37-19533-01

September 14, 1992

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

ATTN: Mr. Reber

Dear Mr. Reber:

Enclosed is a copy of the Financial Assurance for Decommissioning Nuclear Facilities Amendment No. 1. If you need any further information, please call me at (412) 733-5268.

Sincerely,

Joyce L Beskitt

Enclosure

Joyce L. Beskitt
Radiation Safety Officer

113570

SEP 17 1992

AMENDMENT NO. 1
TO
STANDBY TRUST AGREEMENT

Amendment No. 1 dated 8/20/92 to Standby Trust Agreement dated as of 4/23/91 between Union Carbide Chemicals and Plastics Company Inc. and Chemical Bank, as Trustee.

Witnesseth:

Whereas, the parties have agreed to amend the agreement in the manner and to the effect set forth herein; and

Now, therefore the following shall be substituted for Section 5, paragraph 2:

"No withdrawal from the fund can exceed 10 percent of the outstanding balance of the Fund or thirty thousand dollars, whichever is greater, unless NRC approval is attached.

Also, please substitute Standby Trust Agreement Schedule B with Revised Schedule B attached.

In witness whereof, the parties hereto have executed this amendment on the day and year first above written.

Union Carbide Chemicals and
Plastics Company Inc.

By: J.W. Fitzpatrick
J.W. Fitzpatrick
Title: Assistant Treasurer

Chemical Bank

By: G. McFarlane
G. McFarlane
Title: Senior Trust Officer

REVISED 8/20/92

STANDBY TRUST AGREEMENT

SCHEDULE B

REFERENCE: LOC NO. C-279897

AMOUNT ___0___

AS EVIDENCED BY ___N/A___

U. S. Nuclear Regulatory Commission Telephone or Verbal Conversation Record	Date: 8/6/92 Time: Moon

___ Incoming Call	___ Outgoing Call	___ Visit
Person Calling: Eric H. Reber	**Office:** USNRC Region I	**Phone #:**(215) 337-5276
Person Called: Joyce L. Beskitt	**Office:**RSO, Union Carbide	**Phone #:**(412)733-5200

Conversation

Subject: Union Carbide/37-19533-01/Fin. Ass. Def Letter

Summary:

1. Please amend Section 5 of the Standby Trust Fund to include the provision that "No withdrawal from the fund can exceed **10 percent** of the outstanding balance of the Fund or **thirty thousand dollars**, whichever is greater, unless NRC approval is attached."

2. Please amend Schedule B of the Standby Trust Agreement to reference Irrevocable Standby Letter of Credit No. C-279897.

Referred to:

Action Requested:

Action Taken:

OFFICIAL RECORD COPY ML 10 113570

MS20
C3
37-19533-01

LIST OF INSTRUCTIONS

Union Carbide Chemicals and Plastics Company

In reviewing the comments the reviewer will note that there will be some overlap between ICF and OGC comments. The following comments should be included in the basis for the deficiency letter:

1. ICF comments 1 through 7 plus last paragraph.

2. All OGC comments.

All other comments and discussions are for reviewer information.

113570
08-08-91

July 30, 1991

Memo to: Louis Bykoski, NMSS

From: Michael Finkelstein, OGC

Re: Review of Package #8 (ICF Reviews dated May 31, 1991)

Union Carbide Corporation-Parent Company Guarantee

All ICF recommendations should be implemented. The phrase "and found acceptable to the NRC, obligee," in the first paragraph of the Parent Company Guarantee should be deleted.

9300 Lee Highway
Fairfax, Virginia
22031-1207

703/934-3000

ICF INCORPORATED

May 31, 1991

To: Dr. Lou Bykoski, NMSS/NRC

From: Bryan Kelleher and John Collier, ICF Incorporated

Subject: Review of Parent Company Guarantee/Financial Test Submitted by Union Carbide Chemicals and Plastics Company

---

Union Carbide Chemicals and Plastics Company (UCC&P) in Danbury, Connecticut submitted a certification of financial assurance, using a parent company guarantee and financial test demonstration from the Union Carbide Corporation, in the amount of $300,000. The submission assures decommissioning costs for licenses 37-19533-01 and 47-00260-02 issued under 10 CFR Part 30.[1] Upon review of the submission, ICF recommends that NRC require the licensee to modify the submission in the following ways:

(1) Submit either a statement of certification or a decommissioning cost estimate; and

(2) Submit an alternate form of financial assurance.

If the licensee had been able to use the guarantee/financial test mechanism, then it would also have had to modify its submission in the following ways:

(3) Submit a new letter from the licensee's chief executive officer;

(4) Submit guarantor's annual financial statements and auditor's opinion;

(5) Revise the parent guarantee and demonstrate that it has been approved by the guarantor's board of directors;

(6) Submit evidence that the person signing the guarantee is authorized to represent the company; and

(7) Submit a standby trust fund.

These recommendations and other issues are discussed below.

---

[1] ICF assumes that NRC has verified that the certification amount of $150,000 is acceptable for each license under 10 CFR 30.35.

(1) **Submit Either a Statement of Certification or a Decommissioning Cost Estimate**

Under 10 CFR 30.35, a licensee is required to submit either a decommissioning cost estimate or a certification statement as a demonstration that adequate funds will be available for decommissioning. The licensee's submission does not include either a decommissioning cost estimate or a certification statement. Based upon the amounts of assurance specified in the chief financial officer's letter (i.e., $150,000 and $150,000) it appears that a certification statement should have been included. ICF recommends that NRC require the licensee to submit a certification statement certifying compliance with the decommissioning rules, as recommended in NRC's *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), page 1-5.

(2) **Submit an Alternate Form of Financial Assurance**

As stated in 10 CFR 30.35(f)(2), a parent company guarantee, like the surety and insurance methods of financial assurance, must "guarantee that decommissioning costs will be paid should the licensee default." The preamble to the decommissioning rule explains that the parent guarantee mechanism is allowed only when the parent company provides "an independent commitment beyond that of the licensee to expend funds" (53 Federal Register 24036, June 27, 1988).

According to the 1989 Form 10K filed by Union Carbide Chemicals and Plastics Company Inc. (which was not included in the submission), "All of Union Carbide (Corporation's) businesses are conducted by UCC&P and there are no material differences between the consolidated operations of UCC&P and those of Union Carbide." Therefore, although a parent-subsidiary relationship is present between the guarantor and the licensee, it appears that the guarantor is unable to provide an independent financial commitment beyond that of the licensee.

Because the guarantor cannot provide the independent commitment required by NRC, ICF recommends that NRC require the licensee to submit an alternate form of financial assurance. If, however, the licensee had been able to use the parent company guarantee, then ICF would also recommend that NRC require the licensee to modify its submission as described below.

(3) **Submit a New Letter from the Licensee's Chief Executive Officer**

Section 4.7.1 of NRC's *Regulatory Guide 3.66* requires the licensee to submit a letter from its chief executive officer (CEO). In this letter, the licensee must certify that it is a going concern, identify the amount of its tangible net worth, specify whether the firm is required to file a Form 10K with the U.S. Securities and Exchange Commission, and list the date on which the firm's fiscal year ends.

The submission includes such a letter from the chief financial officer (CFO) of the guarantor, providing information about the guarantor. This letter should come from the licensee's CEO, and should provide the information for the licensee firm.

(4) Submit Guarantor's Annual Financial Statements and Auditor's Opinion

Although the submission includes a special report from the independent auditor confirming that the financial data in the letter from the chief financial officer (CFO) agrees with the amounts in the audited financial statements, it does not include the audited financial statements or an auditor's opinion of the financial statements. *Regulatory Guide 3.66*, on page 3-21, requires the guarantor to submit its financial statements, audited by an independent certified accountant, to substantiate its financial position.

If the annual financial statements have not received a "clean" opinion from the independent auditor, then the data derived from those statements in the CFO's letter may not fairly represent the financial condition of the guarantor. In order to determine whether the data used in the financial test fairly present the guarantor's financial condition, licensees using the parent company guarantee should submit the guarantor's annual financial statements, along with the auditor's opinion on those statements.

(5) Revise the Parent Guarantee and Demonstrate that It has been Approved by the Guarantor's Board of Directors

The licensee submitted a guarantee issued by the parent company that generally followed the wording recommended by *Regulatory Guide 3.66*, pages 4-41 to 4-45. The guarantee agreement varies from the required wording, however, in several areas.

- Recital 1 does not include the following phrase that is required if the guarantor has a board of directors: "Guarantor has approval from its board of directors to enter into this guarantee."

- *Regulatory Guide 3.66*, page 4-42, suggests that Recital 7 state the basis of the guarantor's authority for issuing the guarantee as:

  > " ... pursuant to the authority conferred upon the guarantor by ("the unanimous resolution of its directors" or "the majority vote of its shareholders"), a certified copy of which is attached..."

  The submitted guarantee agreement does not include this phrase.

- Recital 8 of the guarantee does not indicate that the licensee must annually provide "<u>revised</u>" financial statements, and a reconciling schedule along with the auditor's special report.

- Recital 11 of the parent guarantee agreement has been modified to state that the guarantor will establish an alternative financial assurance mechanism ". . . within 30 days after it is disallowed from continuing as a guarantor [emphasis added] . . ." In contrast, the recommended wording on page 4-43 of *Regulatory Guide 3.66* states that the guarantor will establish alternative financial assurance ". . . within 30 days after it [the guarantor] determines that it no longer meets the financial test criteria or it is disallowed from continuing as a guarantor [emphasis added]."

- Page 4 of the submitted guarantee does not include a signature of a witness or notary, as is recommended by *Regulatory Guide 3.66* on page 4-44.

Because of the uncertain potential effects of these variations, the licensee should submit a revised guarantee and evidence that the guarantee has been approved by the guarantor's Board of Directors (i.e., a certified copy of the Board's resolution, as required by Recital 7) in order to avoid any implication that the guarantee is not official.

(6) Submit Evidence that the Person Signing the Guarantee is Authorized to Represent the Company

The licensee did not submit any evidence to demonstrate the authority of the chief financial officer to represent the guarantor in the parent company guarantee. Evidence of authority to represent the guarantor is necessary, as recommended by *Regulatory Guide 3.66*, to ensure the validity and enforceability of the mechanism.

(7) Submit a Standby Trust Fund

If the licensee defaults on its decommissioning obligations, the guarantor, under Recital 7, must either (1) carry out required decommissioning activities or (2) make funds available in a trust fund to allow NRC to pay for these activities. If the guarantor chooses the second option, it must establish a trust fund because funds paid directly to NRC must be deposited in the U.S. Treasury and are not available for decommissioning costs. To avoid the possibility that a trust fund will not be readily available if and when needed, *Regulatory Guide 3.66* states that a standby trust fund should be used with a parent company guarantee. If the licensee continues to use the parent company guarantee, it should submit a standby trust fund, acknowledgement, and other related documents as recommended in *Regulatory Guide 3.66* on pages 4-18 through 4-27.

Other Issues

Apart from editorial and non-substantive changes to the standard wording provided in *Regulatory Guide 3.66*, the following modifications are noteworthy:

(2) Paragraph 2 of the CFO's letter does not include the license numbers of the two facilities for which the

guarantor is providing financial assurance. They are included in the next page of the letter, however.

(3) The first paragraph of the parent company guarantee includes the following underlined phrase: "Guarantee made . . . to the [NRC] <u>and found acceptable to the NRC</u>, obligee . . ." As discussed in Recommendations 5 and 6, however, the guarantee agreement may not be acceptable to NRC. NRC may wish to require that the licensee delete this phrase from the guarantee agreement.

(4) Recital 13 does not explicitly identify NRC as the beneficiary. However, NRC is directly named as the "obligee" in the opening paragraph, and is referenced as the beneficiary in Recital 7.

Finally, the Region should ensure that documents submitted by the licensee are originally signed duplicates, as recommended in *Regulatory Guide 3.66*. Unless the documents have been properly signed, NRC cannot be certain that the financial assurance mechanism is enforceable. Because ICF does not possess the original submissions, we cannot verify compliance with these requirements.

attachments

47-00260-02

APPENDIX A
CHECKLIST FOR DECOMMISSIONING FINANCIAL ASSURANCE

NAME OF LICENSEE OR APPLICANT Union Carbide Chemicals and Plastics Company, Inc (UCC&P)

MAILING ADDRESS 39 Old Ridgebury Road

Danbury CT 06817-0001

A. Licensee Part (check one of the following):

X Part 30 Licensee or Applicant ___ Part 70 Licensee or Applicant

___ Part 40 Licensee or Applicant ___ Part 72 Licensee or Applicant

B. Check appropriate item in each category (if applicable)

1. 11/19/90 Date of Financial Assurance Submission

2. ___ Public Entity

X Private Entity

3. X Certification of Financial Assurance $150,000 and $150,000 No Certification Statement

___ Decommissioning Funding Plan

4. (a) ___ Prepayment Option (See Appendix B)
___ Trust Fund
___ Escrow Account
___ Certificate of Deposit
___ Government Fund
___ Deposit of Government Securities

(b) X Surety/Insurance/Other Guarantee (See Appendix C)
___ Surety bond
___ Letter of Credit
___ Line of Credit
X Parent Company Guarantee/Financial Test*

(c) ___ External Sinking Fund, Sinking Account and Surety/ Insurance (See Appendix D)
___ Trust Fund
___ Escrow Account
___ Certificate of Deposit
___ Government Fund
___ Deposit of Government Securities
___ Surety Bond
___ Letter of Credit
___ Line of Credit

(d) ___ Statement of Intent (public entities only)

*May not be used in combination with any other instrument.

Company
License #'s 37-19533-01
47-00260-02

APPENDIX C

CHECKLIST FOR SUBMISSION OF SURETY/INSURANCE/PARENT COMPANY GUARANTEE

A. Check Appropriate Form of Surety/Insurance/Guarantee

____ Surety Bond

____ Letter of Credit

____ Line of Credit

X Parent Company Guarantee/Financial Test*

____ Insurance

B. Check Documents Submitted for Surety/Insurance/Guarantee

1. Surety Bond
   - ____ Surety Bond
   - ____ Standby Trust Agreement
   - ____ Acknowledgement
2. Letter of Credit
   - ____ Letter of Credit
   - ____ Standby Trust Agreement
   - ____ Acknowledgement
3. Line of Credit
   - ____ Verification
   - ____ Standby Trust Agreement
   - ____ Acknowledgement
4. Parent Company Guarantee
   - X Letter from Chief Executive Officer of Applicant or Licensee
   - X Letter from Chief Financial Officer of Parent Company
   - X Financial Test: Alternative [I or II]
   - X Auditor's Special Report and Attached Schedule
   - X Corporate Guarantee
   - NO Standby Trust Agreement
   - NO Acknowledgement
5. Insurance
   - ____ Certificate of Insurance
   - ____ Standby Trust Agreement
   - ____ Acknowledgement

-P/G
- first paragraph
- Recital 1 missing Board approv
- ~~Rec. 3 name of facility~~ OK
- Rec. 5 - address of licensee
- Rec. 7 - missing approval
- Rec. 8 - missing wording
- Rec. 11 - missing wording
- Rec 13 - beneficiary?
- authorized signature? witness or notary?

1) CEO letter
- signed by CFO of parent and references the parent

2) CFO's letter
- no license #'s in par. 2
- no address in par. 1

3) fin test
- meets two of three ratios OK

4) Auditor's Report
- not the recommended wording
- no attached schedule

* May not be used in combination with any other instrument.

Company
License # 37-19533-01
47-00260-02

EXHIBIT 3-8

CHECKLIST OF CRITERIA FOR REVIEW OF PARENT COMPANY GUARANTEES

NO - letter from parent

- Copy of letter from the chief executive officer of the licensee, verifying that it is a going concern* with positive tangible net worth (submitted annually at same time as parent company financial test in Sections 4.7.3 and 4.7.4 of this guide).

NO

- Copy of corporate by-laws or other evidence indicating that parties signing the financial instrument (for the applicant) are authorized to represent the organization in the transaction.

NO

- Evidence that the financial instrument is an originally signed duplicate (e.g., an executed copy of the instrument).

NO

- Evidence that the corporate parent has majority control of the applicant's voting stock.

yes

- Name and address of guarantor.

yes

- Name and address of the licensee.

SAME ADDRESS

yes

- Name and address of the regulatory agency. NRC

yes

- Recitation of the guarantor's authority to provide the guarantee, such as ownership of the licensee.

~~facility names [illegible] addresses are~~ yes

- Identification of the facilities for which the guarantee provides financial assurance and amounts guaranteed for decommissioning activities.

*A "going concern" is a firm that is expected to continue operating at least long enough for current expectations and plans to be carried out and for the reasonably foreseeable future period after that.

Company
License #'s 37-19533-01
47-12260-01

EXHIBIT 3-8 (Continued)

Yes • Description of the primary obligation (decommissioning requirements).

Yes • Unequivocal statement of guarantee.

a. Recitation of the consideration for the guarantee.
b. Liability of the guarantor. - not approved by Board or shareholders?

a. Limitation of liability
b. Condition(s) of liability
c. Effect on liability of a change in the status of the licensee

Yes • Statement that guarantor remains bound despite amendment or modification of license or decommissioning funding plan, reduction or extension of time of performance of required activities, or any other modification or alteration of an obligation of licensee.

Yes • Notice requirements.

Yes • Discharge of the guarantor.

Yes • Termination and revocation.

1. Termination on occurrence of contingency   Recital 11
2. Voluntary revocation by guarantor   - "if no longer meets
3. Effective date of termination or revocation   the financial test criteria"

Yes • Date.

• Signatures.

- not authorized
- no signature of witness or notary

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

AUG 6 1991

MEMORANDUM FOR: John Kinneman, Chief
Nuclear Material Safety
Section Branch
Division of Radiation Safety
and Safeguards, Region I

FROM: Louis Bykoski
Division of Low-Level Waste Management
and Decommissioning, NMSS

SUBJECT: THE OFFICE OF GENERAL COUNSEL (OGC) AND CONTRACTOR COMMENTS ON NONSTANDARD FINANCIAL ASSURANCE SUBMITTALS

Our contractor, ICF Incorporated, and OGC have received and provided comments on thirteen Region I nonstandard financial assurance submittals sent to us for review. The following licensees are included in the mailing.

REGION I

1. U. S. Army Medical Research Institute of Chemical Defense (DFP - statement of intent);
2. Merck Sharp & Dohme Research Laboratories (DFP-parent company guarantee);
3. GTE Products Corporation (DFP-parent company guarantee);
4. Applied Health Physics, Inc. (DFP - line of credit);
5. EG&G, Inc. (DFP - letter of credit);
6. AT&T Network Systems (DFP - letter of credit);
7. Worcester Foundation for Experimental Biology (DFP - trust agreement);
8. Union Carbide Chemicals and Plastics Company (parent company guarantee);
9. Textron Defense Systems (parent company guarantee);
10. New England Deaconess Hospital Corporation (parent company guarantee);
11. General Hospital Corporation (parent company guarantee);
12. The Budd Company (parent company guarantee; and
13. Boehringer Ingelheim Pharmaceuticals, Inc. (parent company guarantee)

The ICF comments are presented in two parts. The first part deals with specific recommendations to correct deficiencies. The second part (Other Issues) provides a discussion of changes to the standard wording that are acceptable and are not considered to be deficiencies. The OGC comments include additional deficiencies that need to be corrected by the licensee and comments for our internal use.

You should carefully review the comments before preparing the deficiency letter. We have enclosed more specific information to help you sort and consolidate the ICF and OGC comments.

Should you have any further questions with regard to the comments, please call me on (301) 492-0572 or Michael Finkelstein of OGC on (301) 492-1623.

Louis Bykoski

Louis Bykoski
Division of Low-Level Waste Management
and Decommissioning, NMSS

Enclosure: As stated.

030-17840

UNION CARBIDE

UNION CARBIDE CORPORATION OLD RIDGEBURY ROAD, DANBURY, CT 06817

May 13, 1991

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406
ATTN: Mr. Reber

RE: Financial Assurance for Decommissioning
Nuclear Facilities

Dear Mr. Reber:

Ms. Glenda Jackson, U.S. Nuclear Regulatory Commission, Washington, D.C., suggested that your home office receive the enclosed original copy of an irrevocable standby letter of credit and standby trust fund established by Union Carbide Chemicals and Plastics Company Inc. ("UCC&P"), on behalf of its research facilities at South Charleston, West Virginia (NRC License No. 47-00260-02) and Bushy Run, Pennsylvania, (NRC License No. 37-19533-01) pursuant to NRC regulations 10 C.F.R Part 30.35 (Financial Assurance and Recordkeeping of Decommissioning). A copy of both documents will be sent to the U.S. Nuclear Regulatory Commission, Region II, Atlanta, Georgia.

Note that the enclosed letter of credit and standby trust fund mechanism replaces the parent company guarantee previously provided for these facilities by Union Carbide Corporation. If you have any questions regarding UCC&P's provision of financial assurance for decommissioning for either of these facilities, please contact the undersigned.

Sincerely yours,

A. T. Sheridan

A.T. Sheridan

CC: Mr. Earl G. Wright
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W.
Atlanta, GA 30323

MAY 16 1991

113570

ATS/kal
attachments
0118L:27

OFFICIAL RECORD COPY ML 10

CHEMICALBANK

Trade Services Group
P.O. Box 44, Church Street Station
New York, N.Y. 10008

Cable Address: Chemsam New York

ISSUE DATE: APRIL 30, 1991
L/C NO.: C-279897

Advising Bank

************* DIRECT *************

APPLICANT:
UNION CARBIDE CHEMICALS A PLASTICS COMPANY INC.
39 OLD RIDGEBURY ROAD
DANBURY, CT 06817-0001

MAIL TO

Beneficiary

U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON D.C 20555

AMOUNT: USD 300,000.00
(THREE HUNDRED THOUSAND AND 00/100 UNITED STATES DOLLARS)

DEAR SIR OR MADAM:

WE HEREBY ESTABLISH OUR IRREVOCABLE STANDBY LETTER OF CREDIT NO. C-279897 IN YOUR FAVOR, AT THE REQUEST AND FOR THE ACCOUNT OF UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC. ("UCC&P"), 39 OLD RIDGEBURY ROAD, DANBURY, CT 06817-0001, UP TO THE AGREGATE AMOUNT OF (THREE HUNDRED THOUSAND), U.S. DOLLARS $300,000.00, AVAILABLE UPON PRESENTATION OF:

(1) YUOUR SIGHT DRAFT, BEARING REFERENCE TO THIS LETTER OF CREDIT NO. C-279897, AND

(2) YOUR SIGNED STATEMENT READING AS FOLLOWS: "I CERTIFY THAT THE AMOUNT OF THE DRAFT IS PAYABLE PURSUANT TO REGULATIONS ISSUED UNDER THE AUTHORITY OF THE U.S. NUCLEAR REGULATORY COMMISSION (NRC), AN AGENCY OF THE U.S. GOVERMENT, PURSUANT TO THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, AND THE ENERGY REORGANIZATION ACT OF 1974."

THIS LETTER OF CREDIT IS ISSUED IN ACCORDANCE WITH REGULATIONS ISSUED UNDER THE AUTHORITY OF U.S. NUCLEAR REGUALTORY COMMISSION (NRC), AN AGENCY OF THE U.S. GOVERMENT, 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 WHICH REQUIRE THAT A HOLDER OF, OR AN APPLICANT FOR, A LICENSE ISSUED UNDER 10 CFR PART 30 PROVIDE ASSURANCE THAT FUNDS WILL BE AVAILABLE WHEN NEEDED FOR DECOMMISSIONING.

THIS LETTER OF CREDIT IS EFFECTIVE AS OF APRIL 25, 1991 AND SHALL EXPIRE ON APRIL 25, 1992, BUT SUCH EXPIRATION DATE SHALL BE AUTOMATICALLY EXTENDED FOR A PERIOD OF ONE YEAR ON APRIL 25, 1992 AND ON EACH SUCCESSIVE EXPIRATION DATE, UNLESS, AT LEAST 90 DAYS BEFORE THE THEN CURRENT EXPIRATION DATE, WE NOTIFY BOTH YOU AND UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC., BY REGISTERED MAIL THAT WE ELECT NOT TO EXTEND THIS LETTER OF CREDIT FOR SUCH AN ADDITIONAL PERIOD AS SHOWN ON THE SIGNED RETURN RECEIPTS.

IF UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC. IS UNABLE TO SECURE ALTERNATIVE FINANCIAL ASSURANCE TO REPLACE THIS LETTER OF CREDIT WHITHIN 30 DAYS OF NOTIFICATION OF CANCELLATION THE NRC

-CONTINUED-

Authorized Signature

C-279897- -001-L1-01-02-01

Provisions applicable to this credit
This credit is subject to the Uniform Customs and Practice for Documentary Credits (1983 Revision.) International Chamber of Commerce Publication No. 400

CHEMICALBANK

Trade Services Group
P.O. Box 44, Church Street Station
New York, N.Y. 10008

Cable Address: Chemsam New York

ISSUE DATE: APRIL 30, 1991
L/C NO.: C-279897

Advising Bank	APPLICANT:
************* DIRECT **************	UNION CARBIDE CHEMICALS & PLASTICS COMPANY INC. 39 OLD RIDGEBURY ROAD DANBURY, CT 06817-0001

MAIL TO

Beneficiary	
U.S. NUCLEAR REGULATORY COMMISSION WASHINGTON D.C 20555	AMOUNT: USD 300,000.00 (THREE HUNDRED THOUSAND AND 00/100 UNITED STATES DOLLARS)

MAY DRAW UPON THE FULL VALUE OF THIS LETTER OF CREDIT PRIOR TO CANCELLATION. WE 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 FINNANCIAL INSTITUTIION OR (2) ANY VIOLATIONS OR REGULATORY REQUIREMENTS THAT COULD RESULT IN SUSPENSION OR REVOCATION OF THE BANK'S CHARTER OR LICENSE TO DO BUSINESS. CHEMICAL BANK 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 UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC. IN ACCORDANCE WITH YOUR INSTRUCTIONS.

EACH DRAFT MUST BEAR ON ITS FACE THE CLAUSE: "DRAWN UNDER LETTER OF CREDIT C-279897, DATED APRIL 25, 1991, AND THE TOTAL OF THIS DRAFT AND ALL OTHER DRAFTS PREVIOUSLY DRAWN UNDER THIS LETTER OF CREDIT DOES NOT EXCEED $300,000.00."

ANY COMMUNICATIONS IN CONNECTION WITH THIS LETTER OF CREDIT SHALL BE SENT TO CHEMICAL BANK, 55 WATER STREET LETTER OF CREDIT DEPT.,ROOM 1702.

Authorized Signature

103

C-279897- -001-L1-01-02-01

Provisions applicable to this credit
This credit is subject to the Uniform Customs and Practice for Documentary Credits (1983 Revision.) International Chamber of Commerce Publication No. 400

STANDBY TRUST AGREEMENT

TRUST AGREEMENT, the Agreement entered into as of April 23, 1991 by and between Union Carbide Chemicals and Plastics Company Inc., a New York corporation, herein referred to as the "Grantor", and Chemical Bank, 55 Water Street, Suite 1820, New York, NY 10041, 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, Part 30. These regulations, applicable to the Grantor, require that a holder of, or an applicant for, a Part 30, 40, 70 or 72 license provide assurance that funds will be available when needed for required decommissioning activities.

WHEREAS, the Grantor, has elected to use a letter of credit to provide all of such financial assurance for the facilities identified herein; and

WHEREAS, when payment is made under a 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 License Number 47-002600-02 and 37-19533-01 issued pursuant to 10 CFR Part 30 as shown in Schedule A.

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. Payments made to the Trustee for the Fund shall consist of cash, securities, or other liquid assets acceptable to the Trustee. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such 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.

<u>Section 5.</u> <u>Payment for Required Activities Specified in the Plan.</u> 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 Secretary of 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 the Grantor's intent to withdraw funds from the escrow fund.

No withdrawal from the fund can exceed 50 percent of the outstanding balance of the Fund or one hundred and twenty thousand 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 from the Fund for expenditures for required activities in such amounts as the NRC 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.

<u>Section 6.</u> <u>Trust Management.</u> 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 soley 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; <u>except that</u>:

(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

(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. The Trustee may vote such shares in its discretion.

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 for prudent management of the Fund;

(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 to otherwise adjust all claims in favor of or against the Fund.

<u>Section 9.</u> <u>Taxes and Expenses.</u> 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 together proper charges and disbursements of the Trustee shall be paid from the Fund.

<u>Section 10.</u> <u>Annual Valuation.</u> After payment has been made into this standby trust fund, the Trustee shall annually, at lease 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 that statement has been furnished to the Grantor and the NRC 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.

<u>Section 11.</u> <u>Advice of Counsel.</u> 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.

<u>Section 12.</u> <u>Trustee Compensation.</u> The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing with the Grantor.

<u>Section 13.</u> <u>Successor Trustee.</u> 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, 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.

<u>Section 14.</u> <u>Instructions to the Trustee.</u> 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 issues orders, requests, or instructions to the Trustee, these shall be in writing, signed by the NRC, or its 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 or the NRC 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, except as provided for herein.

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

<u>Section 16.</u> <u>Irrevocability and Termination.</u> 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 by the Trustee and the NRC 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.

<u>Section 17.</u> <u>Immunity and Indemnification.</u> 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, or the NRC, 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.

<u>Section 18.</u> This Agreement shall be administered, construed, and enforced according to the laws of the State of New York.

<u>Section 19</u>. <u>Interpretation and Severability.</u> As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The description 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.

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

Union Carbide Chemicals and Plastics
Company Inc.

J A Clerico
J.A. Clerico
Vice President, Treasurer and
Chief Financial Officer

ATTEST:

J Macdonald
J. Macdonald
Secretary

Chemical Bank

[Title] G McFarlane
Senior Trust Officer

ATTEST: P. J. McGovan

[Title]
[Seal] Assistant Trust Officer

ACKNOWLEDGEMENT

STATE OF NEW YORK

CITY OF NEW YORK

On this 29th day of April, before me, a notary public in and for the city and State aforesaid, personally appeared G. McFARLANE, and she/he did depose and say that she/he is the Senior Trust Officer of Chemical Bank, Trustee, which executed the above instrument, that she/he knows the seal of said bank; that the seal affixed to such instrument is such corporate seal that it was so affixed by order of the bank; and that she/he signed her/his name thereto by like order.

Frank S. Feczko
[Signature of notary public]

FRANK S. FECZKO
Notary Public, State of New York
No. 41-4861375
Qualified in Queens County
Certificate Filed in New York County
Commission Expires June 2, 1992

My commission Expires: ______________________
[Date]

ACKNOWLEDGEMENT

STATE OF CONNECTICUT

CITY OF DANBURY

On this 23rd day of April, before me, a notary public in and for the city and State aforesaid, personally appeared J.A. Clerico, and he did depose and say that he is the Vice President, Treasurer and Chief Financial Officer of Union Carbide Chemicals and Plastics Company Inc., Grantor, which executed the above instrument, that he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal that it was so affixed by order of the corporation; and that he signed his name thereto by like order.

Ramona E. Trautlein
[Signature of notary public]

RAMONA E. TRAUTLEIN
NOTARY PUBLIC
My commission Expires: MY COMMISSION EXPIRES FEB. 28, 1996
[Date]

Specimen Certificate

Chemical Bank
55 Water Street
Suite 1820
New York, NY 10041

Attention: Trust Division

Gentlemen:

In accordance with the terms of the Agreement with you dated April 23, 1991, I, _______________, Secretary of Union Carbide Chemicals and Plastics Company Inc., hereby certify that the following events have occurred:

1. Union Carbide Chemicals and Plastics Company Inc. ("UCC&P") is required to commence the decommissioning of its facility located at South Charleston, West Virginia (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. Commencement of the decommissioning has been authorized by UCC&P.

____
Secretary of Union Carbide Chemicals
and Plastics Company Inc.

____
Date

STANDBY TRUST AGREEMENT

SCHEDULE A

This Agreement demonstrates financial assurance for the following cost estimates for the following licensed activities:

U.S. NUCLEAR REGULATORY COMMISSION LICENSE NUMBER	NAME AND ADDRESS OF LICENSEE	ADDRESS OF LICENSED ACTIVITY	COST ESTIMATES FOR REGULATORY ASSURANCES DEMONSTRATED BY THIS AGREEMENT
47-00260-02	Union Carbide Chemicals and Plastics Company Inc.	P.O. Box 8361 South Charleston, VW	$150,000
37-19533-01	Union Carbide Chemicals and Plastics Company Inc.	Bushy Run Research Center 6702 Mellon Road Export, PA 15632	$150,000

STANDBY TRUST AGREEMENT
SCHEDULE B

AMOUNT 0

AS EVIDENCED BY N/A

0155L

MAR 0 4 1991

MEMORANDUM FOR: Louis M. Bykoski, NRC Project Officer
Low Level Waste Management, Low Level Regulatory Branch

FROM: John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety
and Safeguards

SUBJECT: NONSTANDARD FINANCIAL ASSURANCE SUBMITTALS RELATED TO THE DECOMMISSIONING RULE

John Austin's August 6, 1990 memorandum set forth a procedure for submitting nonstandard financial assurance submittals to you for review by the NRC contractor. We have also included parent company guarantee's and decommissioning funding plans.

Licensee	License No.	Control No.
Union Carbide Corporation	37-19533-01	113570
Textron Defense Systems	20-02729-05	113598
Immunobiology Research Institute	29-28265-02	113779
AT&T Network Systems	20-03527-01	113367
Department of the Army		113939
Budd Company	37-05680-04	112995
Applied Health Physics, Inc.	37-09135-01	113046
Applied Health Physics, Inc.	37-14600-01	113045
Applied Health Physics, Inc.	SNM-811	113044
Cambridge Neuroscience Research, Inc.	20-27892-01	113931
Massachusetts General Hospital	20-03814-80	112977
New England Deaconess Hospital Corp.	20-00289-07	112651
University of Lowell	20-07446-01	112964

If any of you or the contractors believe any of these cases should more properly be reviewed by the Region, please return them. Some of these cases have obvious, minor deficiencies which we have not attempted to resolve so that we could provide the cases to you promptly.

Original Signed By:
John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety
and Safeguards

cc:
J. Glenn, NMSS
R. Bellamy, RI

RI:DRSS
Villar/bj
CKB for SV
02/27/91

RI:DRSS
Kinneman

02/27/91
OFFICIAL RECORD COPY

FINANCIAL ASSURANCE MEMO/4 - 0002.0.0
02/26/91

030- 17840

UNION CARBIDE CORPORATION 39 OLD RIDGEBURY ROAD, DANBURY, CT 06817-0001

October 29, 1990

JOHN A. CLERICO
VICE PRESIDENT, TREASURER AND
CHIEF FINANCIAL OFFICER

U.S. Nuclear Regulatory Commission
Region I
King Of Prussia, Pennsylvania 19406

Gentlemen:

I am the Chief Financial Officer of Union Carbide Corporation ("UCC"), a corporation. This letter is in support of this firm's use of the financial test to demonstrate financial assurance, as specified in 10 CFR Part 30.

I hereby certify that Union Carbide Corporation is currently a going concern, and that it possesses positive tangible net worth in the amount of $2,926 million as of December 31, 1989.

This firm is required to file a Form 10K with the U.S. Securities and Exchange Commission for the latest fiscal year. This fiscal year of this firm ends on December 31.

I hereby certify that the content of this letter is true and correct to the best of my knowledge.

Very truly yours,

JAClerico

J.A. Clerico
Vice President,
Treasurer and
Chief Financial
Officer

6513c

cc: U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W.
Atlanta, Georgia 30323

113570
11/19/90

UNION CARBIDE CORPORATION 39 OLD RIDGEBURY ROAD, DANBURY, CT 06817-0001

JOHN A. CLERICO
VICE PRESIDENT, TREASURER AND
CHIEF FINANCIAL OFFICER

October 29, 1990

U.S. Nuclear Regulatory Commission
Region I
King of Prussia, Pennsylvania 19406

Gentlemen:

I am the Chief Financial Officer of Union Carbide Corporation ("UCC"), a corporation. This letter is in support of this firm's use of the financial test to demonstrate financial assurance, as specified in 10 CFR Part 30.

This firm guarantees, through the parent company guarantee submitted to demonstrate compliance under 10 CFR Part 30, the decommissioning of the following facilities owned and operated by a subsidiary of this firm. The current cost estimates for decommissioning, so guaranteed, are shown for each facility:

Name of Facility	Location of Facility	Current Cost Estimates
Union Carbide Chemicals and Plastics Company Inc.	Bushy Run Research Center 6702 Mellon Road Export, PA 15632	$150,000
Union Carbide Chemicals and Plastics Company Inc.	South Charleston, West Virginia	$150,000

This firm is required to file a Form 10K with the U.S. Securities and Exchange Commission for the latest fiscal year.

This fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements and footnotes for the latest completed fiscal year, ended December 31, 1989.

Financial Test: Alternative I

		Yes	No	($MM)
1.	Decommissioning cost estimates for facilities- License Nos. 37-19533-01 and 47-00260-02 (total of all cost estimates shown in paragraphs above)			$ 0.300
*2.	Total liabilities			5,557
*3.	Tangible net worth (Total UCC Stockholder's Equity, plus Minority Stockholder's equity in consolidated subsidiaries, less intangibles - patents, trademarks and goodwill-in Footnote 7)			2,926
*4.	Net worth			2,989
*5.	Current assets			2,787
*6.	Current liabilities			2,328
*7.	Net working capital (line 5 minus line 6)			459
*8.	The sum of net income plus depreciation, depletion and amortization			1,071
*9.	Total assets in United States (required only if less than 90 percent of firm's assets are located in the United States) -- excludes assets of UCC's Puerto Rico and international subsidiaries which are included in total reported worldwide consolidated assets.			5,771
10.	Is line 3 at least $10 million?	X		
11.	Is line 3 at least 6 times line 1?	X		
12.	Is line 7 at least 6 times line 1?	X		
13.	Are at least 90 percent of firm's assets located in the United States? If not, complete line 14.		X	
14.	Is line 9 at least 6 times line 1?	X		
	(Guarantor must meet two of the following 3 ratios)			
15.	Is line 2 divided by line 4 less than 2.0?	X		
16.	Is line 8 divided by line 2 greater than 0.1?	X		
17.	Is line 5 divided by line 6 greater than 1.5?		X	

* Denotes figures derived from financial statements at 12/31/89.

I hereby certify that the content of this letter is true and correct to the best of my knowledge.

Very truly yours,

J.A. Clerico
Vice President,
Treasurer and
Chief Financial
Officer

cc: U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W.
Atlanta, Georgia 30323

6513c

KPMG Peat Marwick

Certified Public Accountants

Lee Farm Corporate Park
83 Wooster Heights
Danbury, CT 06810

The Board of Directors
Union Carbide Corporation:

We have audited, in accordance with generally accepted auditing standards, the consolidated balance sheet of Union Carbide Corporation and subsidiaries (the "Company") as of December 31, 1989 and the related consolidated statements of income, stockholders' equity and cash flows for the year then ended, and have issued our report thereon dated February 26, 1990.

In accordance with Title 10 CFR Part 30 of the Code of Federal Regulations, we compared the data in Items 2 through 9 under the heading "Financial Test: Alternative I" of the letter from the Vice President, Treasurer and Chief Financial Officer dated October 29, 1990 in support of the Company's use of the financial test to demonstrate financial assurance, as specified in such regulations, with the audited financial statements.

In connection with the procedure referred to in the paragraph above, no matters came to our attention that caused us to believe that the specified data should be adjusted.

We understand that this report is intended solely to assist you in evaluating the Company's adherence to the requirements of Title 10 CFR Part 30 of the Code of Federal Regulations and should not be used for any other purpose.

KPMG Peat Marwick

October 29, 1990

UNION CARBIDE CORPORATION 39 OLD RIDGEBURY ROAD, DANBURY, CT 06817-0001

JOHN A. CLERICO
VICE PRESIDENT, TREASURER AND
CHIEF FINANCIAL OFFICER

PARENT COMPANY GUARANTEE

Guarantee made this October 29, 1990 by Union Carbide Corporation ("UCC"), a corporation organized under the laws of the State of New York, herein referred to as "guarantor", to the U.S. Nuclear Regulatory Commission ("NRC") and found acceptable to the NRC, obligee, on behalf of our subsidiary Union Carbide Chemicals and Plastics Company Inc. ("UCC&P"), 39 Old Ridgebury Road, Danbury, Connecticut 06817-0001.

Recitals

1. The guarantor has full authority and capacity to enter into this guarantee under its bylaws, articles of incorporation, and the laws of the State of New York, its State of Incorporation.

2. This guarantee is being issued to comply with regulations issued by the 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. NRC has promulgated regulations in Title 10, Chapter I of the code of Federal Regulations, Part 30, which require that a holder of or an applicant for, a materials license issued pursuant to 10 CFR Part 30 provide assurance that funds will be available when needed for required decommissioning activities.

3. The guarantee is issued to provide financial assurance for decommissioning activities for the facilities referenced in License No. 37-19533-01 6702 Mellon Road, Export, PA 15632, and License No. 47-00260-02, South Charleston, West Virginia, as required by 10 CFR Part 30. The decommissioning costs for which are $150,000 for each facility (total of $300,000).

4. The guarantor meets or exceeds the following financial test criteria of Alternative I as detailed in the attached letter and agrees to comply with all notification requirements as specified in 10 CFR Part 30.

   (i) Net working capital and tangible net worth each at least six times the current decommissioning cost estimates; and

   (ii) Assets located in the United States amounting to at least 90 percent of its total assets or at least six times the amount of the current decomissioning cost estimates; and

(iii) Meets two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities that is greater than 0.1; and a ratio of current assets to current liabilities that is greater than 1.5; and

(iv) Tangible net worth of at least $10 million.

5. The guaran'or has majority control of the voting stock for the following licensee covered by this guarantee: UCC&P, 6702 Mellon Road, Export, PA 15632, License No. 37-19533-01; South Charleston, West Virginia, License No. 47-00260-02.

6. Decommissioning activities as used below refers to the activities required by 10 CFR Part 30 for decommissioning of the facilities identified above.

7. For value received from UCC&P, the guarantor, guarantees to the NRC that if the licensee fails to perform the required decommissioning activities, as required by License Nos. 37-19533-01 and 47-00260-02, the guarantor shall

   (a) carry out the required activities, <u>or</u>

   (b) set up a trust fund in favor of the above identified beneficiary in the amount of these current cost estimates for these activities.

8. The guarantor agrees to submit financial statements, financial test data, and a special auditor's report annually 90 days after the close of the parent guarantor's fiscal year.

9. The guarantor agrees that if, at the end of any fiscal year before termination of this guarantee, it fails to meet the financial test criteria, the licensee shall send within 90 days of the end of the fiscal year, by certified mail, notice to the NRC that the licensee intends to provide alternative financial assurance as specified in 10 CRF Part 30. Within 120 days after the end of the fiscal year, the guarantor shall establish such financial assurance if UCC&P has not done so.

10. The guarantor also agrees to notify the beneficiary promptly if the ownership of the licensee or the parent firm is transferred and to maintain this guarantee until the new parent firm or the licensee provides alternative financial assurance acceptable to the beneficiary.

11. The guarantor agrees that within 30 days after it is disallowed from continuing as a guarantor for the facilities, under License No. 37-19533-01 and/or License No. 47-00260-02, it shall establish an alternative financial assurance as specified in 10 CFR Part 30 in the name of UCC&P unless UCC&P has done so.

12. The guarantor as well as its successors and assigns agree to remain bound jointly and severally under this guarantee notwithstanding any or all of the following: amendment or modification of license or NRC-approved decommissioning funding plan for that facility, the extension or reduction of the time of performance of required activities, or any other modification or alteration of an obligation of the licensee pursuant to 10 CFR Part 30.

13. The guarantor agrees that all bound parties shall be jointly and severally liable for all litigation costs incurred by the beneficiary in any successful effort to enforce the agreement against the guarantor.

14. The guarantor agrees to remain bound under this guarantee for as long as UCC&P must comply with the applicable financial assurance requirements to 10 CFR Part 30 for the previously listed facilities, except that the guarantor may cancel this guarantee by sending notice by certified mail to the NRC and to UCC&P, such cancellation to become effective no earlier than 120 days after receipt of such notice by both the NRC and UCC&P as evidenced by the return receipts.

15. The guarantor agrees that if UCC&P fails to provide alternative financial assurance as specified in 10 CFR Part 30, as applicable, and obtain written approval of such assurance from the NRC within 90 days after a notice of cancellation by the guarantor is received by both the NRC and UCC&P from the guarantor, the guarantor shall provide such alternative financial assurance in the name of UCC&P or make full payment under this guarantee.

16. The guarantor expressly waives notice of acceptance of this guarantee by the NRC or by UCC&P. The guarantor also expressly waives notice of amendments or modification of the decommissioning requirements and amendments or modification of the license.

17. If the guarantor files financial reports with the U.S. Securities and Exchange Commission, then it shall promptly submit them to the NRC during each year in which this guarantee is in effect.

I hereby certify that this guarantee is true and correct to the best of my knowledge.

Effective Date: October 29, 1990

Union Carbide Corporation

J.A. Clerico
Vice President, Treasurer
and Chief Financial Officer

6513c

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Securities and Exchange Commission, Washington, D.C. 20549

Annual Report on Form 10-K for the year ended December 31, 1989.
Filed pursuant to Section 13 of the Securities Exchange Act of 1934.
Commission file number 1-10297

Union Carbide Corporation
1989 10-K

Union Carbide Corporation
39 Old Ridgebury Road
Danbury, Connecticut 06817-0001

Tel. (203) 794-2000
State of incorporation: New York
IRS identification number: 06-1255728

Securities registered pursuant to Section 12(b) of the Act:

Class of security:	Registered on:
Common Stock ($1 par value)	New York Stock Exchange Midwest Stock Exchange Pacific Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

NONE

At February 1, 1990, 141,680,549 shares of common stock were outstanding. Non-affiliates held 140,624,012 of those shares, of which the aggregate market value was $3.138 billion.

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months, and (2) has been subject to such filing requirements for the past 90 days. Yes _√_ No ___

Documents incorporated by reference:

Annual report to stockholders for the year ended December 31, 1989 (Parts I and II)
Proxy statement for the annual meeting of stockholders to be held on April 25, 1990 (Parts I and III)

DEFINITION OF TERMS

Unless the context otherwise requires, the terms below refer to the following:

Union Carbide, UCC Consolidated	Union Carbide Corporation and its consolidated subsidiaries
Corporation, UCC	Union Carbide Corporation
domestic	United States and Puerto Rico
domestic operations	Operations of Union Carbide Corporation in this area, including exports
international operations	Operations of Union Carbide in areas of the world other than the United States and Puerto Rico
Chemicals & Plastics	Worldwide chemicals and plastics business of Union Carbide
Industrial Gases	Worldwide industrial gases and coatings service business of Union Carbide
Carbon Products	Worldwide carbon products business of Union Carbide

The use of these terms is for convenience of reference only. The consolidated subsidiaries are separate legal entities which are managed by, and accountable to, their respective Boards of Directors.

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Part I

Item 1. Business

General—Union Carbide Corporation (formerly UCC Holdings, Inc.) was incorporated in 1989 under the laws of the State of New York. The Corporation is a holding company with subsidiaries in three core businesses—chemicals and plastics, industrial gases, and carbon products.

Effective July 1, 1989, Union Carbide Corporation became a holding company through a binding share exchange in which each outstanding share of the predecessor company was exchanged automatically for one share of the holding company. Following the exchange, the holding company took the name "Union Carbide Corporation" and the predecessor company changed its name from "Union Carbide Corporation" to "Union Carbide Chemicals and Plastics Company Inc."

Union Carbide does not produce against a backlog of firm orders; production is geared primarily to the level of incoming orders and to projections of future demand. Significant inventories of finished products, work in process and raw materials are maintained to meet delivery requirements of customers and Union Carbide's production schedules.

Further information about Union Carbide and its businesses is contained in the 1989 annual report to stockholders.

Raw Materials, Products and Markets—See information herein and in the 1989 annual report to stockholders on pages 8 and 9. Unless otherwise indicated, the products of Union Carbide are sold principally by its own sales force, directly to customers.

Union Carbide believes it has contracts or commitments for, or readily available sources of, raw materials and fuel supplies to meet its anticipated needs in all major product areas. Although Union Carbide produces a portion of its raw material requirements, the major portion of its needs is purchased from outside sources. While raw materials are currently available, their continuing availability and prices are subject to world market conditions.

Chemicals & Plastics buys liquefied petroleum gas and naphtha and makes ethylene and propylene. Along with purchased materials, the ethylene and propylene are used to make the following products: polyethylene for film, pipe, electrical insulation, wrap, bags, bottles and other products; ethylene oxide/glycol and derivatives used for antifreeze, polyester fiber, polyester film and resin, petroleum processing, coatings, lubricants, cosmetics and other uses; and alcohols and oxo-alcohols for coatings, preservatives, detergents and cosmetics. Chemicals & Plastics makes and buys other materials to produce acrylates and acetic esters for coatings, latexes, packaging and other products.

From manufactured or purchased chemicals, Chemicals & Plastics produces the following specialty chemicals: specialty glycol ethers, alkyl alkanolamines, acrolein, ethylidene norbornene, and polyvinyl acetate. These specialty chemicals are used in the cosmetics, microbiocides, electronics, automotive, aerospace, oil and gas, and industrial lubricant industries, and as chemical intermediates for pharmaceuticals and agricultural chemicals. Silicones are used in the manufacture of lubricants, electronics, pharmaceuticals, glass fiber and personal care products. The crystal products business makes circuit substrates and laser rods. Polycrystalline silicon is used in the manufacture of single crystal wafers which are used in integrated circuits by the semiconductor business.

Chemicals & Plastics is dependent in its operations upon the availability of hydrocarbon feedstocks and fuels which are purchased from diverse domestic and international sources, including independent oil and gas producers as well as integrated oil companies.

Industrial Gases' main products are the principal components of air—oxygen, nitrogen and argon—which are separated and purified. Electric power is a major operating cost. Gases are sold from on-site plants, through pipelines, in distributable and cylinder form. Demand is primarily from the chemicals, metal fabrication, food-processing, medical, electronics, and steel industries. Acetylene, hydrogen, helium and specialty gases are produced from its own or purchased materials. These gases are marketed for a wide variety of industrial applications, including metal fabrication, aerospace, electronics and basic research and development. *Coatings Service* uses metal and ceramic coatings to improve the wear resistance of machinery components and other critical parts.

Carbon Products buys anthracite coal, premium-grade petroleum coke, coal-tar pitch, petroleum pitch and natural graphite flake to make electrodes, refractory linings, metallurgical specialties and other carbon and graphite forms. These are sold to the steel, ferroalloys, aluminum, chemicals, aerospace and transportation industries. Electric power and natural gas or fuel oil are major operating costs.

None of Union Carbide's industry or geographic segments is dependent to a significant extent upon a single customer or a few customers. However, the Carbon Products business depends upon the steel industry for approximately 66% of its business. About 17% of the Industrial Gases business is also dependent on the steel industry.

Patents; Trademarks; Research and Development—Union Carbide owns a large number of United States and foreign patents that relate to a wide variety of products and processes, has pending a substantial number of patent applications throughout the world, and is licensed under a number of patents. These patents expire at various times over the next 20 years. Such patents and patent applications in the aggregate are important to Union Carbide's competitive position. No single patent or patent application is material. Union Carbide also has a large number of trademarks. The *UNION CARBIDE*, *UCAR*, *UNIPOL*, and *LINDE* corporate trademarks are material; no other single trademark is material.

Essentially all of Union Carbide's research and development activities are company sponsored. The principal research and development facilities of Union Carbide are indicated in the discussion of Properties (Item 2) of this Form 10-K report. In addition to the facilities specifically indicated there, product development and process technology laboratories are maintained at some plants. Union Carbide spent $181 million in 1989 and $159 million in 1988 and in 1987 on company-sponsored research activities to develop new products, processes, or services, or to improve existing ones.

Environment—See Costs Relating to Protection of the Environment on page 13 of the 1989 annual report to stockholders.

Insurance—Union Carbide's policy is to obtain the optimum public liability insurance coverage that is currently available upon terms and conditions and at a price that management considers fair and reasonable. Union Carbide's management believes Union Carbide has public liability insurance in an amount sufficient to meet its current needs in light of pending, threatened, and future litigation and claims. There is no assurance, however, that Union Carbide will not incur losses beyond the limits of, or outside the coverage of, its insurance.

Competition—Each of the major business areas in which Union Carbide participates is highly competitive. In some instances competition comes from manufacturers of the same products as those produced by Union Carbide and in other cases from manufacturers of different products which may serve the same markets as those served by Union Carbide's products. Some of Union Carbide's competitors, such as companies principally engaged in petroleum operations, have more direct access to hydrocarbon feedstocks, and some have greater financial resources than Union Carbide.

There are a number of competitors in each of the businesses in which Union Carbide is active. In some of the individual businesses in which Union Carbide participates there are many competitors; in others there are few. A discussion of competition by industry segment follows.

Chemicals & Plastics—Union Carbide's chemicals and plastics businesses are highly competitive. Competition is primarily on price, product performance and, in certain specialty applications, on service to customers as well.

- Many producers have important industry positions in polyethylene, and Union Carbide is one of the world's largest producers. Other significant producers are Dow Chemical Company, Chevron Corporation, Exxon Corporation, Mobil Corporation, Quantum Chemicals Corporation, Occidental Petroleum Corporation, Phillips Petroleum Company, Enimont S.p.A., Saudi Basic Industry Corporation and The British Petroleum Company p.l.c.

- Union Carbide is the world's largest producer of ethylene oxide/glycol and derivatives. Other significant producers include Shell Oil Company, Dow Chemical Company, BASF Aktiengesellschaft, The British Petroleum Company p.l.c., Texaco Inc., Occidental Petroleum Corporation, Hoechst Celanese Corporation, and Saudi Basic Industry Corporation.

- In solvents and coatings materials, Union Carbide has a significant position in many product areas. Other significant producers include Hoechst Celanese Corporation, Rohm & Haas Company, Eastman Chemical, a division of Eastman Kodak Company, Shell Oil Company, Exxon Corporation, and Quantum Chemicals Corporation.

- Union Carbide is a major marketer of petrochemical products throughout the world. Products that Chemicals and Plastics markets are largely produced in the United States, while competitive products are produced throughout the world.

- Union Carbide participates in a wide range of specialty chemical product/market segments. The competitive position varies widely from one product/market segment to another. Competitors include a number of domestic and foreign companies, both diversified and specialized.

- Union Carbide, in partnership with Shell Oil Company, produces and markets polypropylene and grants UNIPOL polypropylene licenses.

- Union Carbide has formed UOP, a joint venture with a wholly-owned subsidiary of Allied-Signal, Inc. UOP licenses process technology, provides engineering and design services and specialized process equipment to the chemicals, plastics, petroleum, and gas processing industries, and is a leader in the United States in research, development, and manufacture of molecular sieves and a major producer of petroleum refining catalysts. Competitors include a number of domestic and foreign companies, both diversified and specialized.

Industrial Gases—Union Carbide's Industrial Gases business is the largest domestic producer of industrial gases and one of the three largest worldwide competitors, and operates within a highly competitive environment in that business. Competition is based on price, product performance, and service to customers.

- Domestically, Union Carbide is a basic producer of atmospheric gases (oxygen, nitrogen and argon) as well as acetylene, helium, hydrogen, and many specialty gases. Products are supplied to all segments of the marketplace in cylinders and through bulk, pipeline, or on-site supply systems. Other major domestic producers include Airco, Inc., a subsidiary of The BOC Group p.l.c., Air Products and Chemicals, Inc., and American Air Liquide, Inc., a subsidiary of L'Air Liquide S.A.

- On a worldwide basis, Union Carbide is a basic producer of atmospheric gases, acetylene, and some specialty gases. These products, as well as other industrial gases which are imported from the United States or purchased locally, are supplied to many geographic marketplaces. Major worldwide competitors include The BOC Group p.l.c., L' Air Liquide S.A., Air Products and Chemicals, Inc., and AGA Aktiebolag.

- Union Carbide is the worldwide leader in thermal spray coatings used primarily in jet aircraft engines and other applications where a high quality, durable surface is a necessity. Principal domestic competitors are Sermatech Germany G.m.b.H., a subsidiary of Teleflex, Inc., and Chemtronics, Inc., a subsidiary of Interlake, Inc., while overseas each country offers a different competitor.

Carbon Products—Union Carbide's carbon and graphite businesses are highly competitive and compete primarily on the basis of product performance, price, and service to customers.

- Union Carbide is the largest producer of graphite electrodes worldwide. Other significant producers include SIGRI G.m.b.H., Showa Denko K.K., Nippon Carbon Co. Ltd., Tokai Carbon Co. Ltd., Carbon/Graphite Group Inc., Pechiney and Great Lakes Carbon Corporation, a subsidiary of Horsehead Industries, Inc.

- Union Carbide is the leading supplier of carbon and graphite products worldwide. Principal competitors include SIGRI G.m.b.H., Pechiney, Great Lakes Carbon Corporation, a subsidiary of Horsehead Industries, Inc., Stackpole Corporation, Showa Denko K.K., and Nippon Carbon Company Ltd.

Union Carbide's international operations face competition in world markets and a number of other risks inherent in carrying on business outside the United States, including risks of nationalization, expropriation, restrictive action by local governments and changes in currency exchange rates.

Item 2. Properties

Union Carbide operates approximately 483 plants, factories, and laboratories around the world.

The Corporation's headquarters is located in Danbury, Connecticut.

In management's opinion, current facilities, together with planned expansions, provide adequate production capacity to meet Union Carbide's planned business activities in each of its industry segments. Capital expenditures are discussed on pages 14 and 15 of the 1989 annual report to stockholders.

Listed below are the principal manufacturing facilities operated by Union Carbide worldwide by industry segment. Research and engineering facilities are noted. Facilities are listed under the name of the industry segment to which they are principally devoted. Most of the United States and Puerto Rican properties are owned in fee. Union Carbide maintains numerous domestic sales offices and warehouses, substantially all of which are leased premises under relatively short-term leases. All principal international operations' manufacturing properties are owned or held under long-term leases. International operations administrative offices, technical service laboratories, sales offices and warehouses are owned in some instances and held under relatively short-term leases in other instances.

Chemicals & Plastics—At year-end 1989, 17,078 people were employed worldwide.

Principal domestic operations manufacturing facilities and the principal products manufactured there are as follows:

Location	City	Principal Product(s)
California	Sunnyvale	Photoresists
California	Torrance	Latexes
Georgia	Tucker	Latexes
Illinois	Alsip	Latexes
Illinois	Bensenville	Printed circuit chemicals
Indiana	Indianapolis	Coating and bonding systems
Kentucky	Henderson	Dielectric fluid
Louisiana	Greensburg	Hydroxyethyl cellulose derivatives
Louisiana	Taft	Acrolein and derivatives, acrylic monomers, U.V. curing, alkylene amines, cycloaliphatic epoxides, ethylene oxide and glycol, glycol ethers, olefins
Louisiana	Taft (Star Plant)	Polyethylene
Massachusetts	Acushnet	Precision coating equipment
New Jersey	Bound Brook	Coatings resins, phenolic resins, polyethylene compounding, synthetic thickeners
New Jersey	Edison	Lanolin derivatives
New Jersey	Somerset	Latexes
New York	Mamaroneck	Lanolin derivatives
Puerto Rico	Bayamon	Latexes
Texas	Garland	Latexes
Texas	Seadrift	Alkanolamines, ethylene oxide and glycol, glycol ethers, olefins, polyethylene, polypropylene, *Tergitol* surfactants

Chemicals & Plastics (Cont'd)

Location	City	Principal Product(s)
Texas	Texas City	Olefins, organic acids and esters, alcohols, *Tergitol* surfactants, vinyl acetate, coatings resins
Washington	Moses Lake	Polycrystalline silicon[a]
Washington	Washougal	Crystal products
West Virginia	Institute	*Carbowax* polyethylene glycol, hydroxethyl cellulose *Polyox* polyethylene oxide, ketones, *Tergitol* surfactants, ethylidenenorbornene
West Virginia	Sistersville	Antifoams and emulsions, organo functional silanes and silicone surfactants, silicone fluids
West Virginia	South Charleston	Alkylalkanolamines, brake fluids, ketones, miscellaneous specialty products, *UCON* fluids
Wisconsin	Clear Lake	Conformal coating services

Research and development are carried on at technical centers in Bound Brook, Edison and Somerset, New Jersey; Tarrytown, New York; Cary, North Carolina; Washougal, Washington; Sistersville and South Charleston, West Virginia. Process and design engineering is conducted at the technical center in South Charleston, West Virginia in support of domestic and foreign projects.

(a) The Corporation has announced plans to sell this business in 1990.

Principal international operations manufacturing facilities and the principal products manufactured there are as follows:

Country	City	Principal Product(s)
Argentina	Buenos Aires	Silicones
Belgium	Antwerp	Hydroxyethyl cellulose, silicone surfactants
Belgium	Vilvoorde	Lanolin derivatives
Brazil	Cotia	Hydroxyethyl cellulose
Brazil	Cubatao	Polyethylene
Brazil	Itatiba	Silicones
Canada	Boucherville	Molded polyethylene products
Canada	Cowansville	Polyethylene film
Canada	Edmonton	Polyethylene film
Canada	Montreal East	Chemicals
Canada	Orangeville	Polyethylene film
Canada	Orillia	Polyethylene film
Canada	Prentiss	Ethylene glycol
Colombia	Barranquilla	Silicones
Ecuador	Guayaquil	Latex, coatings resins
Germany (West)	Solingen	Photoresists
Hong Kong	Kowloon	Latex, silicones
Indonesia	Jakarta	Latex
Italy	Termoli	Organofunctional silanes
Malaysia	Seremban	Latex, silicones
Singapore	Jurong	Latex
South Korea	Cho'nan	Photoresists

Chemicals & Plastics (Cont'd)

Country	City	Principal Product(s)
Sri Lanka	Ekala	Latex
Thailand	Nonthaburi	Latex
United Kingdom	Hythe	Silicone surfactants
United Kingdom	Northhampton	Conformal coatings services

Research and development are carried on at international operations facilities in Antwerp, Belgium; Montreal East, Canada; Cubatao, Brazil and Versoix, Switzerland.

Industrial Gases—At year-end 1989, 21,931 people were employed worldwide.

Industrial Gases' domestic facilities for the manufacture of industrial gases are located at more than 100 plants, some of which are located at customers' facilities, at various locations throughout the United States. Principal domestic manufacturing facilities for products other than oxygen, nitrogen and argon and the principal products manufactured there are as follows:

Location	City	Principal Product(s)
California	Ontario	Gaseous and liquid hydrogen
California	Torrance	Specialty gases
Connecticut	North Haven	Coatings service
Indiana	East Chicago	Specialty gases
Indiana	Indianapolis	Coatings service
Kansas	Bushton	Gaseous and liquid helium
Kansas	Ulysses	Gaseous and liquid helium
Massachusetts	Norwood	Membrane systems
Missouri	Kansas City	Coatings service
New Jersey	Keasbey	Specialty gases
New York	Niagara Falls	Gaseous and liquid hydrogen
New York	Tonawanda	Air separation equipment
Tennessee	Knoxville	Specialty gases
Texas	Houston	Specialized industrial services

Research and development are carried on at major facilities in Indianapolis, Indiana; Norwood, Massachusetts; Tonawanda and Tarrytown, New York. Engineering facilities are located at Tonawanda and Tarrytown, New York and Springfield, New Jersey.

Principal international operations manufacturing facilities and the principal products manufactured there are as follows:

Country	City	Principal Product(s)
Belgium	Antwerp	Industrial gases
Belgium	Oevel	Industrial gases
Brazil	Various	Industrial gases, air separation equipment, welding and related products
Canada	Fort Saskatchewan	Industrial gases
Canada	Montreal	Industrial gases
Canada	Oakville	Industrial gases
Canada	Prentiss	Industrial gases

Industrial Gases (Cont'd)

Country	City	Principal Product(s)
Canada	Sarnia	Industrial gases
Canada	Sault Ste. Marie	Industrial gases
Canada	Selkirk	Industrial gases
Canada	Tracy	Industrial gases
France	Creil	Industrial gases
France	St. Etienne	Coatings service
Germany (West)	Biebesheim	Industrial gases
Germany (West)	Ratigen	C ...ngs service
Japan	Okigawa	Coatings service
Korea	Giheung	Industrial gases
Korea	Changwon City	Industrial gases and coatings service
Spain	Gijon	Industrial gases
Switzerland	Geneva	Coatings service
United Kingdom	Southam	Coatings service
United Kingdom	Swindon	Coatings service

Research and development are carried on at international operations facilities in Rio de Janeiro, Brazil and Okigawa, Japan.

Carbon Products—At year-end 1989, 6,024 people were employed worldwide.

Principal domestic operations manufacturing facilities and the principal products manufactured there are as follows:

Location	City	Principal Product(s)
California	Irvine	Graphite tooling
Illinois	Robinson	Calcined petroleum coke
New York	Niagara Falls	Calcined coal
Ohio	Cleveland	Specialty inorganic materials
Puerto Rico	Yabucoa[a]	Graphite electrodes
Tennessee	Clarksville	Graphite electrodes
Tennessee	Columbia	Graphite electrodes and carbon products
Tennessee	Lawrenceburg	Carbon and graphite products
West Virginia	Clarksburg	Graphite specialties

Research and development are conducted primarily at a facility in Parma, Ohio. Engineering facilities are also located at Parma.

(a) Shutdown January 1990

Principal international operations manufacturing facilities and the principal products manufactured there are as follows:

Country	City	Principal Product(s)
Brazil	Candeias	Carbon cathodes, graphite electrodes
Canada	Welland	Graphite electrodes
France	Aigueblanche	Graphite electrodes
France	Calais	Graphite electrodes
Italy	Caserta	Graphite electrodes
Italy	Forno Allione	Graphite electrodes
Spain	Pamplona	Graphite electrodes
United Kingdom	Sheffield	Graphite electrodes and graphite products

Item 3. Legal Proceedings

See Note 16 of Notes to Financial Statements on page 32 of the 1989 annual report to stockholders and "Certain Litigation" on page 18 of the proxy statement for the 1990 annual meeting of stockholders.

In December 1989, the U.S. Environmental Protection Agency conditionally proposed a civil penalty of $325,000 jointly against Union Carbide and Rhone-Poulenc Ag Company ("R-P") with respect to alleged violations of the federal Clean Water Act at the Institute, West Virginia facility, portions of which are separately owned by R-P and Union Carbide Chemicals and Plastics Company Inc.

Item 4. Submission of Matters to a Vote of Security Holders

The Corporation did not submit any matters to a stockholder vote during the last quarter of 1989.

Item 5. Market for Registrant's Common Equity and Related Stockholder Matters

Market and dividend information for the Corporation's common stock is contained on pages 18 and 19 of the 1989 annual report to stockholders. The stock exchanges where the stock is traded are listed on page 36 of the 1989 annual report to stockholders.

The number of stockholders of record of the Corporation's common stock is contained on page 1 of the 1989 annual report to stockholders.

A holder of common stock is entitled to receive dividends declared by the Board of Directors on common stock, to have one vote for each share of common stock held of record, and upon liquidation of the Corporation to share ratably in all assets available for distribution to holders of common stock. Stockholders do not have preemptive rights.

From time to time the Corporation may issue shares of preferred stock in series. The Board of Directors is authorized to designate the series and to fix the relative voting, dividend, conversion, liquidation, redemption and other rights, preferences and limitations as between series. If preferred stock is issued, holders of common stock are subject to the dividend and liquidation preferences and other prior rights of the preferred stock. The Corporation has not issued any preferred stock.

The outstanding shares of common stock are validly issued, fully paid and non-assessable.

Item 6. Selected Financial Data

Information pertaining to consolidated operations is included under the captions "From the Income Statement," and "From the Balance Sheet (at year-end)," and dividend information is included under the caption "Other Data" in the statement "Selected Financial Data" on page 19 of the 1989 annual report to stockholders.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

See the information covered in the 1989 annual report to stockholders on pages 11 through 15.

Item 8. Financial Statements and Supplementary Data

The consolidated balance sheet of Union Carbide Corporation and subsidiaries at December 31, 1989 and 1988, and the consolidated statements of income, stockholders' equity and cash flows for each of the years in the three-year period ended December 31, 1989, together with the report thereon of KPMG Peat Marwick dated February 26, 1990, are contained on pages 20 through 34 of the 1989 annual report to stockholders.

Quarterly income statement data is contained on page 18 of the 1989 annual report to stockholders.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

Union Carbide has not had any disagreements covered by this item with KPMG Peat Marwick, its independent auditors.

Item 10. Directors and Executive Officers of the Registrant

For background information on the Directors of Union Carbide Corporation whose terms are expected to continue after the annual meeting of stockholders and persons nominated to become Directors, see pages 9 through 15 of the proxy statement for the annual meeting of stockholders to be held on April 25, 1990.

The principal executive officers of the Corporation are as follows. Data is as of March 15, 1990.

Name	Age	Position	Year First Elected
Robert D. Kennedy	57	Chairman of the Board, President and Chief Executive Officer	1986
Robert P. Krass	53	Vice-President	1987
H. William Lichtenberger	54	Vice-President	1986
John R. MacLean	59	Vice-President	1986
John A. Clerico	48	Vice-President, Treasurer and Principal Financial Officer	1985[a]
Joseph E. Geoghan	52	Vice-President and General Counsel	1987
Gilbert E. Playford	43	Vice-President	1989[b]
O. Jules Romary	59	Vice-President and Secretary	1986
Cornelius C. Smith, Jr.	48	Vice-President	1985
Robert V. Welty	47	Vice-President	1986
Ronald S. Wishart	65	Vice-President	1985
John K. Wulff	41	Vice-President, Controller and Principal Accounting Officer	1988[c]

(a) Elected Vice-President, Treasurer and Principal Financial Officer July 1989.

(b) Elected Vice-President September 1989.

(c) Elected Vice-President, Controller and Principal Accounting Officer July 1989.

There are no family relationships between any officers or directors of the Corporation. There is no arrangement or understanding between any officer and any other person pursuant to which the officer was elected an officer. An officer is elected by the Board of Directors to serve until the next annual meeting of stockholders and until his successor is elected and qualified.

The table on the next page gives a summary of the positions held during at least the past five years by each officer whose position or positions with the Corporation or its subsidiaries during the past five years have not been accounted for by the above table. Each of the officers, except John K. Wulff, has been employed by the Corporation or a subsidiary of the Corporation for the past five years.

Name	Position	Years Held
Robert D. Kennedy	Chairman of the Board, President and Chief Executive Officer	1986 to present
	President and Chief Executive Officer	1986 (8 mos.)
	President	1985 to 1986
	Executive Vice-President	1982 to 1985
Robert P. Krass	Vice-President	1987 to present
	President, UCAR Carbon Company Inc.	1989 to present
	President, Carbon Products Business Group	1987 to 1988
	Vice-President, Carbon Products	1983 to 1987
	General Manager, Carbon Products	1981 to 1983
H. William Lichtenberger	Vice-President	1986 to present
	President, Union Carbide Chemicals and Plastics Company Inc.	1989 to present
	President, Chemicals and Plastics Business Group	1986 to 1989
	President, Solvents and Coatings Materials Division	1985 to 1986
	Vice-President, Linde Division	1980 to 1985
John R. MacLean	Vice-President	1986 to present
	President, Union Carbide Industrial Gases Inc.	1989 to present
	President, Industrial Gases Business Group	1986 to 1988
	President, Linde Division	1982 to present
John A. Clerico	Vice-President, Treasurer and Principal Financial Officer	1989 to present
	Vice-President and Treasurer	1985 to 1989
	Assistant Treasurer	1983 to 1985
Joseph E. Geoghan	Vice-President and General Counsel	1987 to present
	Deputy General Counsel	1985 to 1987
	Assistant General Counsel	1980 to 1985
	Senior Group Counsel	1976 to 1980
Gilbert E. Playford	Vice-President	1989 to present
	Vice President, Treasurer and Chief Financial Officer, Union Carbide Canada Ltd.	1988 to 1989
	Vice President and Treasurer, Union Carbide Canada Ltd.	1984 to 1988
O. Jules Romary	Vice-President and Secretary	1986 to present
	Director of Investor Relations	1984 to 1986
	Vice-President of Human Resources and Communications, Linde Division	1983 to 1984
	Director, Employee Relations, Linde Division	1979 to 1983
Cornelius C. Smith, Jr.	Vice-President	1985 to present
	Assistant General Counsel	1985 (5 mos.)
	Chief Environmental Counsel	1978 to 1985

Name	Position	Years Held
Robert V. Welty	Vice-President	1986 to present
	Director, Employee Relations, Consumer and Industrial Products and Services Group	1985 to 1986
	Vice-President, Human Resources and Communications Linde Division	1985 (2 mos.)
	Director, Human Resources and Communications Linde Division	1984 to 1985
	Director, Employee Relations, Polyolefins Division	1979 to 1984
Ronald S. Wishart	Vice-President	1985 to present
	Special Assignment	1984 to 1985
	Vice-President, Federal Government Relations	1983 to 1984
	Director, Energy and Transportation Policy	1976 to 1983
John K. Wulff	Vice-President, Controller and Principal Accounting Officer	1989 to present
	Vice President and Controller	1988 to 1989
	Deputy Controller	1987 to 1988
	Partner of Peat Marwick Main & Co.	Prior to 1987

Item 11. Executive Compensation

See pages 19 through 24 of the proxy statement for the annual meeting of stockholders to be held on April 25, 1990.

Item 12. Security Ownership of Certain Beneficial Owners and Management

See pages 9 through 15 and 24 of the proxy statement for the annual meeting of stockholders to be held on April 25, 1990.

Item 13. Certain Relationships and Related Transactions

No reportable transactions in 1989.

Part IV

Item 14. Exhibits, Financial Statement Schedules, and Reports on Form 8-K

(a) The following documents are filed as part of this report:

1. The consolidated financial statements set forth on pages 20 through 32 and the Independent Auditors' Report set forth on page 34 of the 1989 annual report to stockholders are incorporated by reference in this Form 10-K Annual Report.

2. The following schedules should be read in conjunction with the consolidated financial statements incorporated by reference in Item 8 of this Form 10-K Annual Report. Schedules other than those listed have been omitted because they are not applicable.

3. The Consent and Report of Independent Auditors appears on page 20 of this Annual Report on Form 10-K.

4. Exhibits—See Exhibit Index on pages 22 through 25 for exhibits filed with this Annual Report on Form 10-K.

Schedule II—Amounts Receivable from Related Parties and Underwriters, Promoters, and Employees Other Than Related Parties

Union Carbide Corporation and Consolidated Subsidiaries — Thousands of dollars

	Balance at beginning of period	Additions[c]	Deductions[d]	Balance at end of period
Year Ended December 31, 1989				
J. S. Dewar[a]	$151	$ 5	$ 77	$ 79
Y. Takeuchi[b]	260	—	55	205
	$411	$ 5	$132	$284
Year Ended December 31, 1988				
J. S. Dewar[a]	$139	$ 12	$ —	$151
Y. Takeuchi[b]	169	148	57	260
	$308	$160	$ 57	$411
Year Ended December 31, 1987				
J. S. Dewar[a]	$130	$ 9	$ —	$139
Y. Takeuchi[b]	115	70	16	169
	$245	$ 79	$ 16	$308

[a] J. S. Dewar is a director of Union Carbide Canada Limited, a subsidiary of the Corporation. In 1979, Union Carbide Canada adopted a long-term stock purchase plan for its senior management employees. The plan provides for incentive awards in the form of interest-free loans for the purchase of common shares of the subsidiary.

[b] Y. Takeuchi is a director of Union Carbide Japan K.K., a subsidiary of the Corporation. Mr. Takeuchi has been granted a loan by Union Carbide Japan K.K. with varying interest rates and repayment dates.

[c] Represents borrowings and translation adjustments.

[d] Represents repayments and translation adjustments.

Schedule V—Property, Plant, and Equipment

Union Carbide Corporation and Consolidated Subsidiaries

Classification	Balance at beginning of period	Additions at cost[(a)]	Retirements or sales	Other changes[(b)] Add (deduct)	Translation adjustments	Balance at end of period
		Millions of dollars, year ended December 31, 1989				
Land and improvements	$ 415	$ 15	$ 6	$ (11)	$ 1	$ 414
Buildings	762	27	16	(3)	1	771
Machinery and equipment	7,361	597	274	42	21	7,747
Construction in progress and other	471	146	(1)	(22)	2	598
	$9,009	$785	$295	$ 6	$ 25	$9,530
		Millions of dollars, year ended December 31, 1988				
Land and improvements	$ 410	$ 14	$ 3	$ (6)	$ —	$ 415
Buildings	745	42	3	(21)	(1)	762
Machinery and equipment	7,119	507	98	(165)	(2)	7,361
Construction in progress and other	365	108	—	(3)	1	471
	$8,639	$671	$104	$(195)	$ (2)	$9,009
		Millions of dollars, year ended December 31, 1987				
Land and improvements	$ 405	$ 16	$ 12	$ (5)	$ 6	$ 410
Buildings	739	35	16	(31)	18	745
Machinery and equipment	7,077	407	317	(155)	107	7,119
Construction in progress and other	337	44	5	(21)	10	365
	$8,558	$502	$350	$(212)	$141	$8,639

(a) Union Carbide's capital expenditures for the years 1985 through 1989 are included in Selected Financial Data on page 19 of the 1989 annual report to stockholders. Information on Union Carbide's construction program is included elsewhere in the 1989 annual report to stockholders.

(b) All years include additions for acquired companies and certain reclassifications of property. Also, 1988 and 1987 include transfers to investments carried at equity.

(c) Following is a summary of lives used for calculating depreciation.

Class of Property	Lives Used
Land improvements	20 years
Buildings	20 to 40 years
Machinery and equipment	10 to 15 years
Leasehold improvements	Lease period

Schedule VI—Accumulated Depreciation and Amortization of Property, Plant, and Equipment

Union Carbide Corporation and Consolidated Subsidiaries

Classification	Balance at beginning of period	Additions: Charged to profit and loss	Deductions: Retirements or sales	Other changes[a] Add (deduct)	Translation adjustments	Balance at end of period
	Millions of dollars, year ended December 31, 1989					
Land and improvements	$ 167	$ 12	$ 2	$ (4)	$ —	$ 173
Buildings	351	25	9	(4)	1	364
Machinery and equipment	4,065	458	200	63	10	4,396
Construction in progress and other[b]	10	3	—	—	—	13
	$4,593	$498	$211	$ 55	$ 11	$4,946
	Millions of dollars, year ended December 31, 1988					
Land and improvements	$ 157	$ 12	$ (2)	$ (4)	$ —	$ 167
Buildings	333	24	(14)	(20)	—	351
Machinery and equipment	3,728	435	74	(23)	(1)	4,065
Construction in progress and other[b]	77	2	35	(35)	1	10
	$4,295	$473	$ 93	$ (82)	$ —	$4,593
	Millions of dollars, year ended December 31, 1987					
Land and improvements	$ 153	$ 12	$ 8	$ (2)	$ 2	$ 157
Buildings	328	25	14	(13)	7	333
Machinery and equipment	3,542	423	281	(12)	56	3,728
Construction in progress and other[b]	156	3	1	(81)	—	77
	$4,179	$463	$304	$(108)	$ 65	$4,295

(a) All years include additions for acquired companies and certain reclassifications of units of property. The 1989 amount principally represents accumulated depreciation resulting from the write-down to net realizable value of the polysilicon business. Also, 1988 and 1987 include transfers to investments carried at equity.

(b) Consists primarily of the amortization of leaseholds.

Schedule VII—Guarantees of Securities of Other Issuers

Union Carbide Corporation and Consolidated Subsidiaries

Name of Issuer of Securities Guaranteed by Person for Which Statement is Filed	Title of Issue of Each Class of Securities Guaranteed	Total Amount Guaranteed and Outstanding[a]
		Millions of dollars at December 31, 1989
DCS Capital Corporation	Commercial loans	$54[b]

(a) See Note 16 of Notes to Financial Statements on page 32 of the 1989 annual report to stockholders. Union Carbide's contingent obligations of $472 million disclosed in Note 16 include the amount presented in this schedule.

(b) Represents the portion of the debt of DCS Capital Corporation for which Union Carbide Corporation is responsible. Such portion is not directly guaranteed by the Corporation but is secured by a cash deficiency agreement that is guaranteed by the Corporation. The annual aggregate amount of interest for which the Corporation is responsible is approximately $7 million.

At December 31, 1989, Union Carbide Corporation had a contingent obligation with respect to $40 million of pollution abatement facility obligations assumed by purchasers of Union Carbide facilities. This amount has been included in Union Carbide's contingent obligations disclosed in Note 16 of Notes to Financial Statements referred to above.

Schedule VIII—Valuation and Qualifying Accounts

Union Carbide Corporation and Consolidated Subsidiaries

	Balance at beginning of period	Additions Charged to costs and expenses	Deductions Items determined to be uncollectible, less recovery of amounts previously written off	Balance at end of period
		Millions of dollars, year ended December 31, 1989		
Allowance for doubtful accounts	$41	$20	$26	$35
		Millions of dollars, year ended December 31, 1988		
Allowance for doubtful accounts	$65	$18	$42	$41
		Millions of dollars, year ended December 31, 1987		
Allowance for doubtful accounts	$51	$34	$20	$65

Schedule IX—Short-Term Borrowings

Union Carbide Corporation and Consolidated Subsidiaries

Category of aggregate short-term borrowings	Balance at end of period	Weighted average interest rate[a]	Maximum month-end amount outstanding during the period	Average amount outstanding during the period[b]	Weighted average interest rate during the period[a] [b]
		Dollar amounts in millions, year ended December 31, 1989			
Bank loans	$445	13%	$470	$413	13%
		Dollar amounts in millions, year ended December 31, 1988			
Bank loans	$270	14%	$378	$299	12%
		Dollar amounts in millions, year ended December 31, 1987			
Bank loans	$264	16%	$791	$526	11%

(a) Beginning in 1989, foreign currency gains on debt of affiliates operating in hyperinflationary countries in Latin America have been included in interest expense. Prior year weighted average interest rates have been restated to conform to the 1989 presentation.

(b) Based on balances outstanding at the end of each month.

Schedule X—Supplementary Income Statement Information

Union Carbide Corporation and Consolidated Subsidiaries

	Millions of dollars, year ended December 31,		
	1989	1988	1987
Maintenance and repairs	$473	$437	$372
Taxes other than income taxes			
Real and personal property	$ 59	$ 58	$ 59
Social security	139	132	117
Other taxes	28	27	24
	$226	$217	$200

Part IV (Cont.)

Consent and Report of Independent Auditors

The Board of Directors
Union Carbide Corporation

Under date of February 26, 1990, we reported on the consolidated balance sheet of Union Carbide Corporation and subsidiaries as of December 31, 1989 and 1988, and the related consolidated statements of income, stockholders' equity and cash flows for each of the years in the three-year period ended December 31, 1989, as contained on pages 20 through 32 in the 1989 annual report to stockholders. These consolidated financial statements and our report thereon are incorporated by reference in the annual report on Form 10-K for the year 1989. In connection with our audits of the aforementioned consolidated financial statements, we also have audited the related financial statement schedules as listed in Item 14(a)2. These financial statement schedules are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statement schedules based on our audits.

In our opinion, such financial statement schedules, when considered in relation to the basic consolidated financial statements taken as a whole, present fairly, in all material respects, the information set forth therein.

KPMG PEAT MARWICK

Stamford, Connecticut
February 26, 1990

The Board of Directors
Union Carbide Corporation

We consent to the incorporation by reference in each of the Registration Statements of Union Carbide Corporation on Form S-3 (Nos. 33-26185 and 33-30521), and on Form S-8 (Nos. 2-63978, 2-90419, 33-22125, 33-24466 and 3[illegible]4469) of our reports dated February 26, 1990, relating to the consolidated balance sheet of Union Carbide Corporation and subsidiaries as of December 31, 1989 and 1988, and the related consolidated statements of income, stockholders' equity and cash flows and related schedules for each of the years in the three-year period ended December 31, 1989, appearing, and incorporated by reference, in the annual report on Form 10-K of Union Carbide Corporation for the year ended December 31, 1989.

We also consent to the reference to our firm under the heading "Experts" in each of the above referenced registration statements.

KPMG PEAT MARWICK

Stamford, Connecticut
March 26, 1990

Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Corporation has duly caused this annual report to be signed on its behalf by the undersigned, thereunto duly authorized.

Union Carbide Corporation

March 28, 1990

John K. Wulff
Vice-President, Controller and Principal Accounting Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this annual report has been signed below by the following persons on behalf of the Corporation and in the capacities indicated on March 28, 1990.

Robert D. Kennedy
Chairman of the Board, President and Chief Executive Officer and Director

Harry J. Gray
Director

Rozanne L. Ridgway
Director

John A. Clerico
Vice-President, Treasurer and Principal Financial Officer

James M. Hester
Director

Alice M. Rivlin
Director

John K. Wulff
Vice-President, Controller and Principal Accounting Officer

Vernon E. Jordan, Jr.
Director

William S. Sneath
Director

John J. Creedon
Director

Ronald L. Kuehn, Jr.
Director

J. Clayton Stephenson
Director

C. Fred Fetterolf
Director

C. Peter McColough
Director

Russell E. Train
Director

Exhibit Index

Exhibit No.

3.1	Restated Certificate of Incorporation.
3.2	By-Laws of the Corporation as amended June 26, 1989.
4.1.1	Indenture dated as of January 1, 1986, between the Union Carbide Chemicals and Plastics Company Inc. (Prior to July 3, 1989, Union Carbide Corporation and hereinafter referred to as the "Company") and Manufacturers Hanover Trust Company, as Trustee, for the debt securities issued pursuant to the Company's exchange offer made on December 17, 1985, as amended on January 2, 1986 (See Exhibit 4.1 of the Corporation's 1985 Form 10-K).
4.1.2	Second Supplemental Indenture, dated as of December 10, 1986, between the Company and Manufacturers Hanover Trust Company, as Trustee, amending the Indenture described in Exhibit No. 4.1.1 (See Exhibit 4.1.2 of the Corporation's 1986 Form 10-K).
4.2.1	Note Purchase Agreement, dated as of December 1, 1986, among the Company and the Purchasers listed therein, and Indenture dated as of Dec[illegible]mber 1, 1986, between the Company and Manufacturers Hanover Trust Company, as Trustee, f[illegible] the Company's 8.60% and 9.10% Senior Notes Due 1989 and 1990, respectively (See Exhibit 4.[illegible] the Corporation's 1986 Form 10-K).
4.2.2	First Supplemental Indenture, dated [illegible]f July 15, 1988, between the Company and Manufacturers Hanover Trust Company, as Trustee, amending the indenture described in Exhibit No. 4.2.[illegible] (See Exhibit 4(c) of the Company's Registration Statement on Form S-3, File No. 33-14734).
4.3	Note Purchase Agreement, dated as of April 15, 1987, among the Company and the Purchasers listed therein, and Indenture dated as of April 15, 1987, between the Company and Manufacturers Hanover Trust Company, as Trustee, for the Company's 9.35% Senior Notes due April 15, 1992 (See Exhibits 4(a) and 4(b) of the Company's Registration Statement on Form S-3, File No. 33-14735).
4.4	Indenture dated as of March 1, 1987, between the Company and Mellon Bank, N.A., as Trustee, for the Company's 7.5% Convertible Subordinated Debentures Due 2012 (See Exhibit 4.3 of the Corporation's 1986 Form 10-K).
4.5	Indenture dated as of March 1, 1987, between the Company and Continental Illinois National Bank and Trust Company of Chicago, as Trustee, for the Company's 9.75% Senior Subordinated Notes Due 1994 (See Exhibit 4.4 of the Corporation's 1986 Form 10-K).
4.6	The Corporation will furnish to the Commission upon request any other debt instrument referred to in Item 601(b)(4)(iii)(A) of Regulation S-K.
10.1.1	Multiple Option Facility agreement, dated as of December 15, 1987, among the Company, Union Carbide Eurofinance B.V., the banks listed therein, and two banks as agents (the "MOF") (See Exhibit 10.2 of the Corporation's 1987 Form 10-K).
10.1.2	Amendment No. 1 dated as of December 31, 1987, to the MOF (See Exhibit 10.2.2 of the Corporation's 1988 Form 10-K).
10.1.3	Amendment No. 2 dated as of January 1, 1989, to the MOF (See Exhibit 10.2.3 of the Corporation's 1988 Form 10-K).
10.1.4	Amendment No. 3 dated as of December 28, 1989, to the MOF.
10.2	Credit Agreement, dated as of December 28, 1989, among the Corporation, the Company, the banks listed therein, and three banks as agents.

Exhibit No.

10.3.1	Rights Agreement, dated as of March 1, 1986, between the Company and Manufacturers Hanover Trust Company, as Rights Agent (See Exhibit 10.3 of the Corporation's 1985 Form 10-K).
10.3.2	Amendment dated as of July 3, 1986, to the Rights Agreement (See Exhibit 10.3.2 of the Corporation's 1986 Form 10-K).
10.4	Rights Agreement, dated as of July 26, 1989, between the Corporation and Manufacturers Hanover Trust Company, as Rights Agent (See Exhibit 2(a) of the Corporation's Registration Statement on Form 8-A, File No. 1-10297).
10.5	Transfer Agreement, dated as of January 1, 1989, between the Company and UCAR Carbon Company Inc. (See Exhibit 10.4.1 of the Corporation's 1988 Form 10-K).
10.6	Transfer Agreement, dated as of January 1, 1989, between the Company and Union Carbide Industrial Gases Inc. (See Exhibit 10.4.2 of the Corporation's 1988 Form 10-K).
10.7*	Indemnity Agreement, dated as of July 25, 1986, between the Corporation and Robert D. Kennedy (See Exhibit 10(a) of the Corporation's Registration Statement on Form S-3, File No. 33-9922). The Indemnity Agreement filed with the Commission is substantially identical in all material respects, except as to the parties thereto and dates thereof, with Indemnity Agreements between the Corporation and each person who was a Director or Officer of the Corporation on July 25, 1986, and each person elected as a Director or Officer of the Corporation after that date.
10.8	Agreement, dated as of October 2, 1986, among the Company, GAF Corporation, GAF Chemicals Corporation, Jay & Company, Inc., Mayfair Investments, Inc. and Mr. Samuel J. Heyman (See Exhibit 10(b) of the Corporation's Registration Statement on Form S-3, File No. 33-9922).
10.9.1*	1984 Union Carbide Stock Option Plan (See Appendix B of the proxy statement for the annual meeting of stockholders held April 27, 1983).
10.9.2*	Amendment to 1984 Union Carbide Stock Option Plan (See Exhibit 10.9.2 of the Corporation's 1985 Form 10-K).
10.9.3*	Resolutions adopted by the Board of Directors of the Corporation on January 22, 1986, with respect to the 1984 Union Carbide Stock Option Plan (See Exhibit 10.12.4 of the Corporation's 1986 Form 10-K).
10.9.4*	Resolutions adopted by the Board of Directors of the Corporation on April 17, 1986, with respect to the 1984 Union Carbide Stock Option Plan (See Exhibit 10.12.5 of the Corporation's 1986 Form 10-K).
10.9.5*	Amendment to the 1984 Union Carbide Stock Option Plan effective October 28, 1987 (See Exhibit 10.11.5 of the Corporation's 1987 Form 10-K).
10.9.6*	Amendment to the 1984 Union Carbide Stock Option Plan effective March 1, 1988 (See Exhibit 10.11.6 of the Corporation's 1987 Form 10-K).
10.9.7*	Amendment to the 1984 Union Carbide Stock Option Plan effective June 1, 1989.
10.10	1983 Union Carbide Bonus Deferral Program (See Exhibit 10.7 of the Corporation's 1984 Form 10-K).
10.11.1	1984 Union Carbide Cash Bonus Deferral Program (See Exhibit 10.9 of the Corporation's 1984 Form 10-K).
10.11.2	Amendment to 1984 Union Carbide Cash Bonus Deferral Program (See Exhibit 10.18.2 of the Corporation's 1986 Form 10-K).

Exhibit No.

10.12.1* Grantor Trust Agreement for the Equalization Benefit Plan for Participants of the Retirement Program Plan for Employees of Union Carbide Corporation and its Participating Subsidiary Companies and the Supplemental Retirement Income Plan (See Exhibit 10.13 of the Corporation's 1985 Form 10-K).

10.12.2* Amendment to Grantor Trust Agreement for the Equalization Benefit Plan for Participants of the Retirement Program Plan for Employees of Union Carbide Corporation and its Participating Subsidiary Companies and the Supplemental Retirement Income Plan (See Exhibit 10.14.2 of the Corporation's 1988 Form 10-K).

10.13* Equalization Benefit Plan for Participants of the Retirement Program Plan for Employees of Union Carbide Corporation and its Participating Subsidiary Companies (See Exhibit 10.14 of the Corporation's 1985 Form 10-K).

10.14.1* Supplemental Retirement Income Plan (See Exhibit 10.15 of the Corporation's 1985 Form 10-K).

10.14.2* Amendment to Supplemental Retirement Income Plan (See Exhibit 10.16.2 of the Corporation's 1988 Form 10-K).

10.15.1* 1987 Stock Compensation Plan for Non-Employee Directors (See Appendix A of the proxy statement for the annual meeting of stockholders held on April 22, 1987).

10.15.2 Amendment to the 1987 Stock Compensation Plan for Non-Employee Directors effective December 1, 1989.

10.16.1* 1988 Union Carbide Corporation Long-Term Incentive Plan (See Exhibit 10.18 of the Corporation's 1988 Form 10-K).

10.16.2* Amendment to the 1988 Union Carbide Long-Term Incentive Plan effective June 1, 1989.

10.16.3 Amendment to the 1988 Union Carbide Long-Term Incentive Plan effective August 1, 1989.

10.17.1* Severance Compensation Agreement, dated November 22, 1985, between the Corporation and Robert D. Kennedy. The Severance Compensation Agreement filed with the Commission is substantially identical in all material aspects, except as to the parties thereto and the dates thereof, with Agreements between the Corporation and the Officers and certain other employees of the Corporation as of November 22, 1985 and January 29, 1988 (See Exhibit 10.23 of the Corporation's 1986 Form 10-K).

10.17.2 Amendment dated September 26, 1989 to the Severance Compensation Agreement, dated November 22, 1985, between the Corporation and Robert D. Kennedy. The Amendment filed with the Commission is substantially identical in all material aspects, except as to the parties thereto, with Amendments to the Severance Compensation Agreements between the Corporation and the Officers and certain other employees of the Corporation as of November 22, 1985 and January 29, 1988.

10.18 Severance Compensation Agreement, dated September 26, 1989, between the Corporation and Gilbert E. Playford. The Severance Compensation Agreement filed with the Commission is substantially identical in all material aspects, except as to the parties thereto, with Agreements between the Corporation and the Officers and certain other employees of the Corporation as of September 26, 1989.

10.19 Severance Arrangement between the Company and Vance E. Sonnenberg (See Exhibit 10.34 of the Corporation's 1986 Form 10-K).

10.20 Letter Agreement between the Company and John A. Stichnoth, Esq., dated July 6, 1987, with respect to Retiree Group-Term Life Insurance (See Exhibit 10.29 of the Corporation's 1987 Form 10-K).

Exhibit Index (Cont.)

Exhibit No.

10.21 Resolution adopted by the Board of Directors of the Company on February 24, 1988, with respect to pension benefits for Louis G. Peloubet (See Exhibit 10.30 of the Corporation's 1987 Form 10-K).

10.22 Severance Arrangement between the Company and J. Clayton Stephenson, dated March 1, 1989 (See Exhibit 10.26 of the Corporation's 1988 Form 10-K).

10.23* Resolution adopted by the Board of Directors of the Corporation on November 30, 1988 with respect to an executive life insurance program for officers and certain other employees (See Exhibit 10.27 of the Corporation's 1988 Form 10-K).

10.24* 1989 Union Carbide Bonus Plan (See Exhibit 10.28 of the Corporation's 1988 Form 10-K).

10.25 Union Carbide Corporation Benefits Protection Trust.

10.26* Resolutions adopted by the Board of Directors of the Corporation on February 24, 1988, with respect to the purchase of annuities to cover liabilities of the Corporation under the Equalization Benefit Plan for Participants of the Retirement Program Plan for Employees of Union Carbide Corporation and its Participating Subsidiary Companies and the Supplemental Retirement Income Plan.

10.27* Resolutions adopted by the Board of Directors of the Corporation on June 28, 1989, with respect to the purchase of annuities to cover liabilities of the Corporation under the Supplemental Retirement Income Plan.

11.1 Computation of Earnings per Share - Five years ended December 31, 1989.

11.2 Computation of Earnings per Share - 1989 quarters ended March 31, June 30, September 30, and December 31.

11.3 Computation of Earnings per Share - 1988 quarters ended March 31, June 30, September 30, and December 31.

13 The Corporation's 1989 annual report to stockholders (such report, except for those portions which are expressly referred to in this Form 10-K, is furnished for the information of the Commission and is not deemed "filed" as part of the Form 10-K).

22 Subsidiaries of the Corporation.

24 Consent of KPMG Peat Marwick on page 20.

*The obligations of the Company hereunder were assumed by the Corporation as of July 1, 1989.

113570

Union Carbide Corporation

Union Carbide Chemicals and Plastics

Union Carbide Industrial Gases

UCAR Carbon

1989 Annual Report

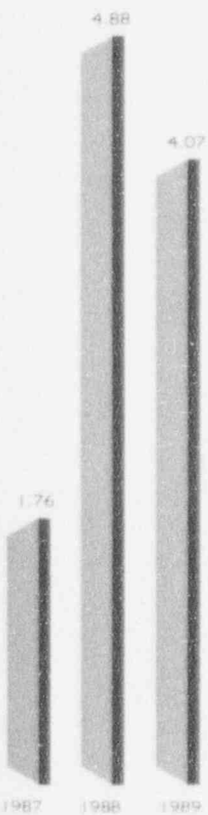
ON THE COVER:

[illegible]

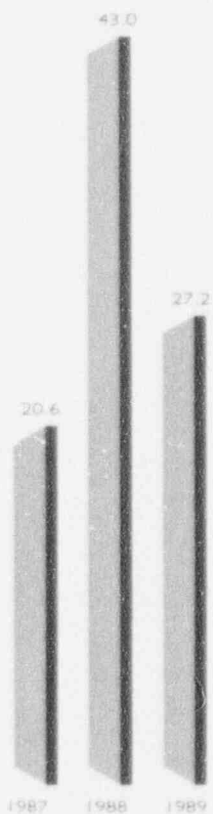
Dollar amounts in millions (except per share figures)	1989	1988	Percent Change
For the Year			
Sales	$ 8,744	$ 8,324	+ 5
Net income	573[a]	662[b]	-13
Per share — Primary	4.07[a]	4.88[b]	-17
— Fully diluted	3.92[a]	4.66[b]	-16
Dividends	140	155	-10
Per share	1.00	1.15	-13
Capital expenditures	785	671	+17
At Year-End			
Total assets	$ 8,546	$ 8,441	+ 1
Total debt	2,735	2,757	- 1
UCC stockholders' equity	2,383	1,836	+30
Per share	16.83	13.34	+26
Shares outstanding (thousands)	141,578	137,602	+ 3
Number of stockholders	66,390	66,491	—
Number of employees	45,987	43,992	+ 5

a Includes a charge of $56 million, or $0.40 per share primary ($0.37 per share fully diluted), mainly representing facility shutdown costs and severance and relocation benefits associated with restructuring the U.S. bulk and packaged gas businesses of Union Carbide Industrial Gases (see Note 4 on page 25).

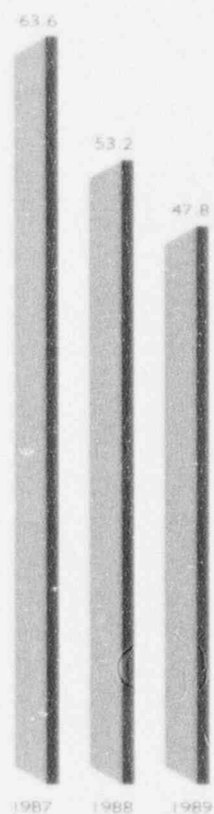
b Includes a charge of $58 million, or $0.43 per share primary ($0.40 per share fully diluted), associated with the settlement of Bhopal litigation (see Note 16 on page 32).



PRIMARY EARNINGS PER SHARE
(IN DOLLARS)



RETURN ON AVERAGE EQUITY
(IN PERCENT)



RATIO OF DEBT TO CAPITAL
(IN PERCENT)

figures far exceeding what I said we hoped to achieve in my 1988 letter to stockholders.

We did a lot last year to improve our long-term outlook and maximize the return on the shareholders' investment. We reduced our debt to capital ratio to under 50%, down from a high of almost 80% less than four years ago. In the same period we managed down our incremental cost of borrowing by a third, from the 15% range to the 10% range. In 1989 we obtained an investment-grade credit rating, our first since 1985. We invested $181 million in research and development, a nearly 14% increase over 1988. We added capacity in product areas where we are the leader in cost and market share.

And we introduced and successfully marketed several new products and systems, including ones that remove potentially harmful chemicals from the environment. Let me add that Union Carbide's own record in reducing the emissions and hazardous waste that our plants generate is one of the best in the industry and one in which shareholders can take great pride.

Through the Supreme Court of India, we also reached a settlement last year with the Government of India over the Bhopal tragedy. Our goal from the beginning has been to get fair compensation to the victims as rapidly as possible. Although the administration of the Government of India has announced its opposition to the settlement, we are confident that no legal basis exists for overturning it.

Union Carbide's people accomplished a lot in 1989, as they do every year. Our scientists and engineers continue to win many of the most important awards in the industry. Last year they won the Kirkpatrick Award, which is presented only once every two years and is chemical engineering's highest honor, for developing a new combustion system to aid in the safe destruction of hazardous materials at Superfund waste sites.

During the course of the year people at all levels made enormous contributions to maximize shareholder value. To encourage the highest level of performance and to recognize those who achieve it, I established the Chairman's Awards, the first of which were presented in 1989, for quality and excellence in pursuit of the company's core values: customer focus; people excellence; safety and environmental leadership; simplicity and focus; and technology leadership. Recipients of this award are Union Carbide's best.

A quality work force obviously is key to maintaining any company's competitiveness, but particularly a technology-based one like Union Carbide. Regrettably, the American public educational system is not graduating enough quality students with the skills to succeed in the modern workplace. Last year I commissioned a corporate task force on this issue. The task force's report,* which I presented to the Board of Directors in October, is a blueprint for our Corporation's involvement in building a world-class educational system. This is one of the most pressing competitive issues our company — and our country — will face in the 1990's. You may be sure that we at Union Carbide will be active participants.

Robert D. Kennedy

Robert D. Kennedy
Chairman, President and
Chief Executive Officer
February 28, 1990

*"Under-educated Uncompetitive USA" (Union Carbide Corporation, copyright 1989). For a copy, write me at the Office of the Chairman, Union Carbide Corporation, 39 Old Ridgebury Road, Danbury, Conn. 06817-0001.

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11-1990

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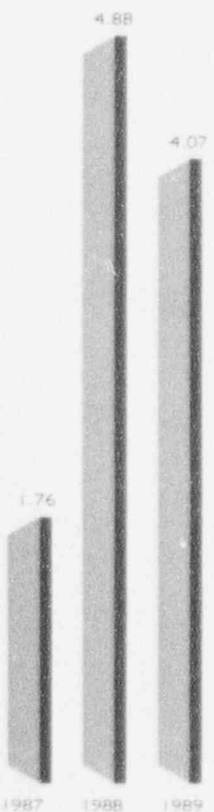
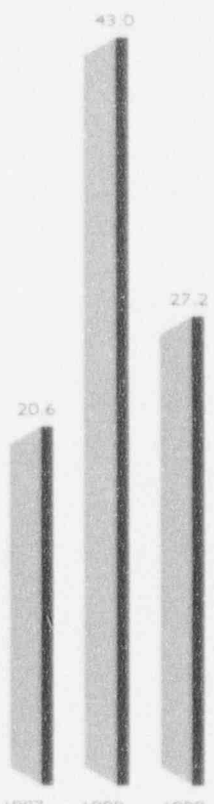


PRIMARY EARNINGS PER SHARE
(IN DOLLARS)



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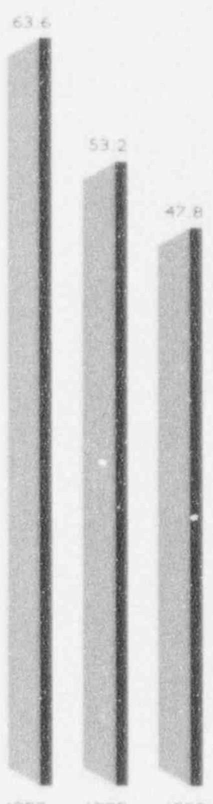

RATIO OF DEBT TO CAPITAL
(IN PERCENT)

This report marks the first full year of operations after stockholder approval of our realignment as a holding company. Each of our three core businesses is now a separate company, reporting its financial results directly to stockholders in its own summary annual report. Each has new latitude and authority to make decisions. Each depends on its own resources to grow profitably. What we all share in common is a set of core values and a commitment to creating shareholder wealth, which is why we realigned in the first place. The simplicity of operation gained by the realignment is already paying for the hard work it entailed.

Even with softening chemical prices in the 1989 second half, we turned in a strong financial performance for the year. Per share earnings of $4.07, which included a fourth quarter charge of $0.40 per share associated primarily with restructuring our domestic industrial gas business, were second only to 1988's record $4.88 per share. Sales of $8.74 billion were 5% higher than the previous year's. Although the chemical business cycle will continue to affect our results, our position as technology leader and low-cost producer in our core businesses means that our financial performance on average should provide a 20% return on equity through the cycle, real capital growth of 6% to 7% a year and financial results that even at the low point in the cycle should rank in the top half of companies regarded as chemical investor alternatives.

That is exactly what happened in 1989. Our 1989 chemicals and plastics profits (measured on the basis of return on capital) placed us second among the top 10 publicly traded chemical companies in the United States, the same position we held in 1988. We also achieved an overall return on equity of 27.2%, and real capital growth of 10.5%, both figures far exceeding what I said we hoped to achieve in my 1988 letter to stockholders.

We did a lot last year to improve our long-term outlook and maximize the return on the shareholders' investment. We reduced our debt to capital ratio to under 50%, down from a high of almost 80% less than four years ago. In the same period we managed down our incremental cost of borrowing by a third, from the 15% range to the 10% range. In 1989 we obtained an investment-grade credit rating, our first since 1985. We invested $181 million in research and development, a nearly 14% increase over 1988. We added capacity in product areas where we are the leader in cost and market share.

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Robert Kennedy

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February 28, 1990

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Our report to shareholders this year uses the format of an interview with Chairman and Chief Executive Officer Robert D. Kennedy, who discusses recent significant developments at Union Carbide. He was interviewed by John Berry, a business and financial journalist who has written for *The Washington Post, Fortune, Time* and *Business Week*.

HAS THE REALIGNMENT BEGUN RETURNING THE BENEFITS YOU EXPECTED?

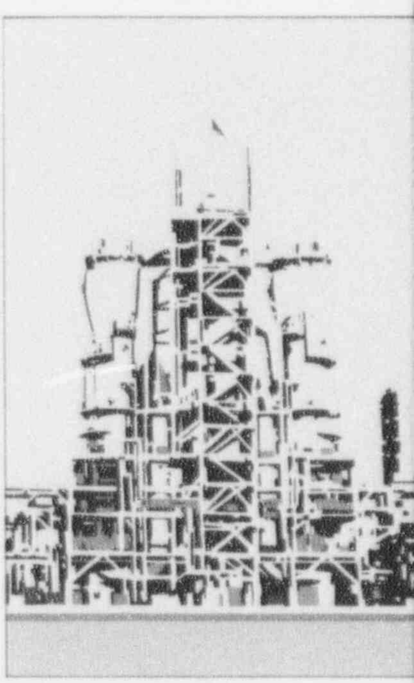
Most of the benefits are in front of us. As we told our Board at the outset, it would probably cost $15 to $20 million to do the job, and it has, but it will pay for itself by the end of 1991. In fact, our businesses already are reporting savings through more effective coordination and more efficient use of people. The real benefit is getting the businesses to focus on competitive advantage — released from the typical bureaucratic concerns that can cripple big companies like ours.

WHAT IS THE FUNCTION OF THE CORPORATE HOLDING COMPANY IN THE REALIGNMENT?

Our goal is for each business to be a leader in its own competitive field, and for the Corporation to provide the enabling environment in which this can happen.

The Corporation espouses five fundamental values under a quality banner: customer focus; people excellence; safety and environmental leadership; simplicity and focus; and technology leadership.

Beyond this, the Corporation fosters synergy among the businesses, provides financial strength, and permits savings in the pooling of treasury, tax and shareholder services as well as pension benefits.



LEADING PROCESS TECHNOLOGY

A LEADING WALL STREET ANALYST WROTE RECENTLY THAT CARBIDE "IS ONCE AGAIN EMERGING AS A TECHNOLOGY LEADER." COULD YOU ELABORATE?

He might have had in mind the acclaim the company has received for new processes and inventions. For example, a team from our industrial gases business just received the Kirkpatrick Award, the industry's most prestigious honor, for a combustion process to deal with contaminated waste and soil. Our oxo alcohol process accounts for most of the new capacity built in the world since 1979, and the UNIPOL

TMOSPHERIC GASES FOR NORTH AMERICA

EMIUM QUALITY ELECTRODES

process accounts for a quarter of world polyethylene capacity.

In 1989, Carbide scientists came up with the UNICARB system, an environmental breakthrough that reduces pollution by using carbon dioxide to replace 30% to 70% of the hydrocarbon solvents currently used to dilute sprayed paints. These solvents are volatile organic compounds that are prime contributors to air pollution. We also introduced a new system for making urethane foams without the use of CFC's. Fully applied, the system could eliminate 10% of CFC use worldwide, which is significant in light of global warming concerns. And we just announced plans to open the world's first commercial multi-plastics recycling plant, which grew out of our expertise in polymer technology.

HISTORICALLY, THE CHEMICAL INDUSTRY HAS GONE THROUGH CYCLES, AND ANALYSTS SAY CURRENTLY YOU ARE INTO A DOWN CYCLE. HOW HAS CARBIDE PREPARED FOR THIS?

We can't avoid cycles. Excess capacity in the chemical industry has caused margins to fall from the 1988 peak. It's affecting us all, but we think that we are in a position to outperform the other commodity chemical companies in the down cycle.

The up cycle ran from late 1986 through the first half of 1989, during which time our growth in earnings and return on capital were at the very top of the industry. We took the opportunity during the 1980's to rationalize and modernize our facilities. We believe we can make money even when many of our competitors are simply covering their cash costs. In fact, our commodity chemical businesses should be in a position to earn close to their cost of capital even at the bottom of the cycle. Beyond that, we've continued to support our specialty chemical businesses. Our specialty polyethylene, specialty coatings and technology licensing businesses, for example, are affected only minimally by the decline of basic chemical prices. Our other core businesses are less affected and will produce relatively consistent returns over time.

HOW IS CARBIDE RESPONDING TO PUBLIC CONCERNS ABOUT THE CHEMICAL INDUSTRY?

We've always been very tough on ourselves. Since 1985, we've been even tougher. Carbide has introduced safety and environmental practices to protect workers in our plants and the communities around them that, I think, are the most rigorous in the world. As chairman of the Chemical Manufacturers Association, I have been involved in an industry initiative called *Responsible Care,* which recognizes the stewardship of manufacturers through the life cycle of their products — from development to disposal. CMA members sign on to a set of principles and management practice codes; they are an obligation of membership.

Just one of our goals as we upgrade technology and operating practices is the complete elimination of emissions of known or suspected carcinogens. We are making this information available to the public through periodic reports and dialogue.

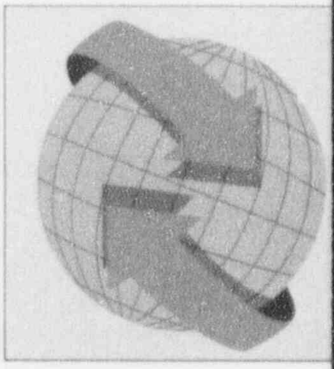
ENVIRONMENTAL STEWARDSHIP

CAN U.S. CHEMICAL MAKERS STAY COMPETITIVE IN THE FACE OF MOUNTING REGULATIONS?

Yes, because the regulations are a response to public fears everywhere — not just in the United States. Our foreign competitors face the same pressures. As a result, environmental efforts by the industry worldwide are increasing. Everyone will have to respond to the same rising tide of concern, regulation and cost.

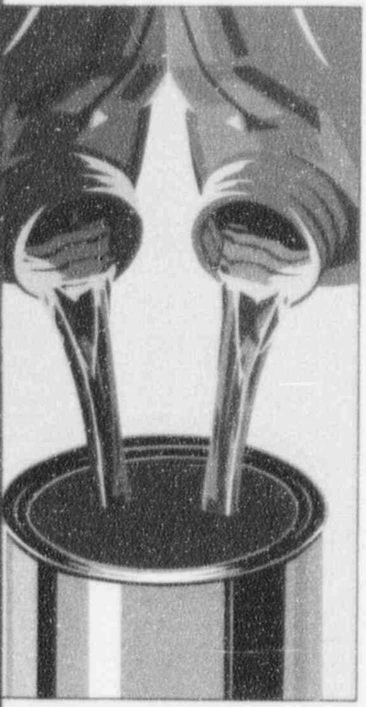
WHAT ROLE DO INDUSTRIAL GASES AND CARBON PRODUCTS PLAY IN CARBIDE'S OVERALL STRATEGY?

By virtue of the size and dynamic of chemicals and plastics, gases and carbon products are often overlooked by the financial community. But each is a leading business in its own field and an important contributor to the Corporation. The restructuring in our industrial gases business in the United States will further reduce our cost of producing oxygen, nitrogen and argon across the entire North American system and improve the distribution of these products to our customers across the country.



GLOBAL OPPORTUNITY

In carbon products, we produce the best electrodes in the world at the lowest cost, and because



ALITY PRODUCTS

INOLOGY LEADERSHIP

capacity has been reduced as unprofitable plants close down, we expect the business returns to improve in the future.

WHAT PROGRESS HAS CARBIDE MADE IN REDUCING ITS DEBT?

Enormous. Our debt to capital ratio has come down from a high of almost 80% less than four years ago to 47.8% at the end of 1989, and our total debt, at $2.7 billion, is less than half of what it was at the peak. As a result, our credit rating is back to "investment grade." Our ratios will continue to improve as we grow equity faster than debt and reinvest at returns that exceed our cost of capital.

SOME SECURITIES ANALYSTS CALL CARBIDE STOCK "A BARGAIN." WHEN WILL THE STOCK REFLECT UNDERLYING VALUE?

I think it will take a couple of more years of demonstrated performance to get the stock to where it should be. The realignment should help by making our company more understandable to the financial community.

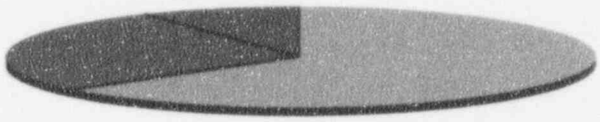
AS PART OF REALIGNMENT, ARE ACQUISITIONS OR ALLIANCES ANTICIPATED?

Global competition is changing rapidly. New alliances and mergers are developing everywhere to strengthen businesses and business portfolios across national borders. In our realignment, we have encouraged each business to look at anything that will make it stronger and, therefore, create greater shareholder value in the long run. Certainly there are terrific opportunities everywhere — Western and Eastern Europe, the Pacific Rim, Mexico and Brazil.

IN YOUR SPEECHES, YOU MENTION CARBIDE'S QUALITY CONTROL EFFORTS. COULD YOU DESCRIBE THIS PROCESS?

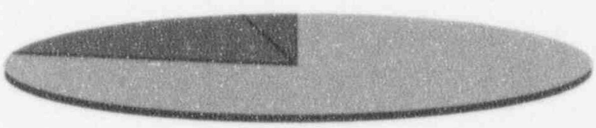
Each of our businesses has its own Total Quality Program. Some have been at it longer than others, but the results are starting to show everywhere in improved productivity, reduced costs, better performance ratings from our customers and in the attitudes of our people. The greatest lesson of Total Quality is that there is no such thing as best — only better.

1989 Industry Segment Sales
(Millions of dollars)



Chemicals & Plastics:	$5,613	(64%)
Industrial Gases:	$2,349	(27%)
Carbon Products:	$ 782	(9%)

1989 Industry Segment Operating Profit
(Millions of dollars)



Chemicals & Plastics:	$1,003	(79%)
Industrial Gases:	$ 222	(17%)
Carbon Products:	$ 44	(4%)

Union Carbide Chemicals and Plastics

Industrial chemicals
Polyolefins
Solvents and coatings materials
Specialty chemicals

Union Carbide Chemicals and Plastics (UCC&P) uses state-of-the-art process technologies to convert manufactured and purchased ethylene and propylene into the higher-value chemicals and polymers marketed by the Company. In addition, UCC&P has specialty businesses outside the ethylene chain of chemicals, including technology licensing services.

The leading UCC&P end markets as a percent of sales are: film, molding and extrusion—21%; paints, coatings and adhesives—20%; textiles—10%; wire and cable—8%; automotive, including antifreeze—8%; chemical intermediates—6%; household and personal care products—5%.

Union Carbide Industrial Gases

Oxygen
Nitrogen
Argon
Acetylene
Hydrogen
Helium

Specialty gases
Membrane systems
Industrial gas plants and equipment
Coatings service
Advanced ceramics

Union Carbide Industrial Gases (UCIG) separates air into its components for industrial and medical uses. UCIG is the largest producer of industrial gases in North America and ranks among the top three suppliers worldwide. Our coatings service business uses metal and ceramic coatings to improve the wear resistance of machinery components.

The leading UCIG end markets as a percent of sales are: metal fabrication—21%; chemicals—17%; steel—17%; medical—9%; electronics—6%; aerospace—6%; food—4%.

UCAR Carbon

Graphite electrodes
Carbon specialties
Graphite specialties
Flexible graphite

UCAR Carbon is the world's leading supplier of graphite electrodes for electric furnace steelmaking. In addition, this globally positioned company manufactures a variety of other carbon and graphite products used in industry.

The percentage of sales accounted for by the leading UCAR Carbon end markets is typically: steel—66%; non-ferrous metals—25%; chemical, electrochemical, nuclear, aerospace—5%; transportation—4%.

Financial Index

RESULTS OF OPERATIONS

SUMMARY—CONSOLIDATED RESULTS

Dollar amounts in millions (except per share figures)	1989	1988	1987
Consolidated sales	$8,744	$8,324	$6,914
Segment operating profit	1,269	1,480	777
Net income	573	662	232
Per share—primary	4.07	4.88	1.76
Per share—fully diluted	3.92	4.66	1.75

Sales in 1989 increased 5% over 1988 and 26% over 1987 levels. All industry segments have recognized sales increases in each of the past two years. Export sales from domestic operations, principally chemicals and plastics, have been particularly strong, increasing to $911 million in 1989, 14% above 1988 and 52% over 1987 exports.

Segment operating profit, however, decreased to $1.269 billion in 1989, 14% below the record level of 1988, but still 63% above 1987 results. Chemicals & Plastics operating profit was affected by a deteriorating gross margin during 1989, which, together with planned increases in research and development and overhead expenses associated with expanded construction and new business development activities, caused a 17% reduction in operating profit as compared with the prior year. In addition, Industrial Gases and Carbon Products recognized pre-tax restructuring charges of $73 million and $4 million respectively, which accounted for their respective year-to-year operating profit decreases of 3% and 4%. In the absence of the restructuring charge, Industrial Gases' operating profit would have increased 28% over 1988. Operating profit for 1989 and all prior periods presented has been restated to exclude the effects of foreign currency gains on debt and prior period tax liabilities of affiliates operating in hyperinflationary countries—principally Brazil. The gains have been reclassified to interest and tax expense respectively, with no effect on previously reported net income. In addition, a portion of corporate staff costs previously included in General expenses—net in the segment results has been allocated to segment operating profit.

Percent change from prior year (Domestic operations)	1989	1988	1987
Sales	+1	+21	+5
Average selling prices	0	+11	0
Volume	+1	+10	+5

Net income decreased 13% in 1989 as compared with 1988 but at $573 million was approximately 2-1/2 times the 1987 level. Net income for 1989 included an after-tax charge of $56 million ($0.40 per primary share), representing principally Industrial Gases and Carbon Products restructuring costs as well as $8 million of after-tax costs involved in completing the worldwide realignment of Union Carbide's core businesses. After-tax charges of $58 million ($0.43 per primary share) and $53 million ($0.40 per primary share) were recognized in 1988 and 1987, respectively, representing litigation accruals principally related to resolution of the Bhopal litigation.

Dollar amounts in millions	1989	1988	1987
Number of employees (year-end)	45,987	43,992	43,119
Employment costs (wages, benefits, payroll taxes)	$1,859	$1,590	$1,531

SEGMENT ANALYSIS: CHEMICALS & PLASTICS

Sales of $5.613 billion increased 2% over 1988 to a record, principally reflecting continued strong pricing for most product lines other than polyethylene and strong volumes for all major product lines throughout the first half of 1989. Sales weakened in the second half of the year as a result of deteriorating pricing for ethylene oxide/glycol, polyethylene and certain other industrial chemicals; reduced volumes for ethylene oxide/glycol and the absence of revenues from the urethane polyols and propylene glycols businesses, which were sold in September. Polyethylene prices declined steadily during the first three quarters of 1989 before stabilizing in the fourth quarter, but volume was strong throughout the year.

Operating profit decreased 17% to $1.003 billion as compared with the record levels achieved in 1988. Increased maintenance expense, start-up costs of new facilities, increased expenses related to expanded capital projects, costs associated with extreme cold weather conditions near year-end 1989, as well as the reduced sales in the second half of the year all contributed to a decreasing gross margin trend throughout the year notwithstanding generally favorable feedstock pricing. The 1989 gross margin ratio declined to 30.3% from 32.9% in 1988. Research and development activities, largely in support of new product and new business development, particularly for specialty businesses, were expanded during the year resulting in a 15% increase in expenditures to $143 million. Selling, administrative and other expenses increased by 15% to $405 million reflecting support for increased new business development activities as well as the impact of non-capitalizable engineering expenses associated with our expanded capital spending program. As a percentage of sales, selling, administrative and other expenses increased to 7.2% from 6.4% in 1988. Income from joint venture partnerships, included in Other income—net, decreased to $82 million in the current year from $95 million in 1988. Improved results from UOP (our catalysts and process systems joint venture) were more than offset by reduced results from other partnerships. Other income—net included a third-quarter gain of $96 million (of a total pretax gain of $101 million) from the sale of the urethane polyols and propylene glycols businesses, largely offset by a third-quarter charge of $90 million resulting from a write-down to net realizable value of the polysilicon business. Based upon trends evident at year-end 1989, near term 1990 results are expected to continue to be negatively affected by weakened prices of industrial chemicals coupled with likely increases in feedstock costs.

Sales in 1988 reached $5.525 billion and rose 28% above the previous year. Most businesses within the group contributed to the excellent results, with industrial chemicals and polyolefins enjoying exceptionally strong increases. Sales increased in all geographic areas, and domestic average selling prices were up 17%, with higher prices particularly for industrial chemicals and polyolefins.

Operating profit in 1988 increased 125% to $1.204 billion when compared with 1987. Improved operating profit was reported in all geographic areas. Gross margin ratios increased from 27.6% in 1987 to 32.9%. High plant capacity use, favorable feedstock costs and higher sales prices and volumes were key factors that improved the gross margin ratio. Research and development expenditures, which aggregated $124 million in 1988 as compared with $123 million in 1987, were directed primarily at new product and new business development. Selling, administrative and other expenses were essentially flat at $353 million. As a percentage of sales, however, these costs decreased substantially to 6.4% from 8.0% in the prior year. Partnership income in 1988 was $95 million, an increase of $79 million over 1987.

Sales in 1987 at $4.325 billion were approximately 16% higher than in the prior year, propelled by both volume gains and higher prices. Domestic average selling prices were up 4%. Almost all businesses posted important sales gains. Sales increased in all geographic areas, with the largest gains recorded domestically, and in Europe and Canada.

Operating profit in 1987 reached $534 million, with increases reported in all geographic areas. In particular, the ethylene oxide/glycol and derivatives business and the polyolefins business capitalized on strong demand and higher prices to widen margins. Operating profit was also boosted by a significant rise in exports resulting mainly from the continuing weakness of the U.S. dollar. Partially offsetting these increases were increased selling, administrative and other expenses, primarily related to expanded customer service and support. Selling, administrative and other expenses declined as a percent of sales to 8.0%.

Dollar amounts in millions	1989	1988	1987
Sales	$ 5,613	$ 5,525	$ 4,325
% of UCC Consolidated	64%	66%	63%
Operating profit	$ 1,003	$ 1,204	$ 534
% of UCC Consolidated	79%	81%	69%
Number of employees (year-end)	17,078	16,362	17,108

SEGMENT ANALYSIS: INDUSTRIAL GASES

Sales in 1989 set a new record at $2.349 billion, an increase of 13% from 1988. Worldwide volumes for our primary products increased 6% over 1988. Sales dollars and volumes improved in all geographic areas with Brazilian sales improving 31%. Sales growth in Brazil resulted from 12% volume growth, pricing actions that kept pace with inflation and devaluation of local currency at rates less than inflation. Two price increases were implemented late in the year domestically, reversing several years of pricing weakness. Volume growth continued to be higher than the economic growth of the countries in which we operate, mainly as a result of our market diversification efforts and emphasis on new technologies.

Operating profit in 1989 was $222 million, down 3% from 1988. The 1989 results include a $73 million before-tax restructuring charge for facility shutdown costs and severance and relocation benefits necessary to strengthen the competitive position of our U.S. operations. Excluding the restructuring charge, all geographic areas recorded increases in operating profit compared with 1988. The worldwide gross margin ratio increased to 41.7% in 1989 from 40.9% in 1988 reflecting volume, pricing and productivity improvements internationally as well as favorable currency impacts in Brazil. The domestic gross margin ratio was down slightly as weak pricing earlier in the year and increased operating costs more than offset volume growth and productivity gains. Research and development activities, including support of non-cryogenic processes for air separation were expanded during 1989 resulting in a 10% increase in research and development expense to $33 million. Selling, administrative and other expenses increased by 18% to $415 million as compared with $351 million in 1988. The impact of local inflation and unfavorable currency effects in Brazil, costs associated with the consolidation of U.S. packaged gas operations and the acquisition of several distributors accounted for the major portion of this increase. As a percentage of sales, selling, administrative and other expenses were 17.4%, a slight increase from 1988. Excluding the restructuring charge, Other expenses — net decreased by $15 million to $61 million compared to $76 million in 1988. Other expenses — net in 1988 included a $10 million asset impairment charge. Included in 1989 and 1988 were foreign currency adjustments of $106 million and $109 million respectively, primarily in Brazil. Assuming a continuation of stronger pricing and volume trends evident at year-end 1989 and as benefits from the U.S. restructuring programs begin to be realized, operating profit is expected to improve in 1990.

Sales of $2.076 billion in 1988 increased 11% over 1987 primarily due to higher international results. Although domestic volumes increased significantly over 1987, pricing continued to weaken in 1988. Sales rose 22% in Latin America, 9% due to volume growth.

Operating profit in 1988 was $230 million, down slightly from $237 million in 1987. Lower domestic results, primarily due to the $10 million charge for impairment of assets related to an enhanced oil recovery project, consolidation costs in the packaged gases business and continued price weakness were only partially offset by improved international results. The gross margin ratio of 40.9% was about level with 1987. Research and development expense increased 11% over 1987 to $30 million, reflecting expanded programs in the United States and in Brazil. Selling, administrative and other expenses increased by 12% to $351 million as compared with $314 million in 1987. Other expenses — net increased $44 million to $76 million as compared to $32 million in 1987, mainly reflecting $50 million of increased foreign currency adjustments in Brazil as well as the asset impairment charge.

Sales in 1987 grew approximately 6% over 1986 as a result of higher international sales. Volume growth in the domestic business was more than offset by pricing pressures.

Operating profit in 1987 was $237 million. Improved international results were more than offset by a decline in the domestic business due to pricing pressures and weakness in the steel industry.

Dollar amounts in millions	1989	1988	1987
Sales	$2,349	$2,076	$1,872
% of UCC Consolidated	27%	25%	27%
Operating profit	$ 222*	$ 230	$ 237
% of UCC Consolidated	17%	16%	31%
Number of employees (year-end)	21,931	20,252	19,205

*Includes a $73 million restructuring charge.

SEGMENT ANALYSIS: CARBON PRODUCTS

Sales in 1989 increased 8% over 1988 to $782 million, the highest level of the last three years. Increased shipments were recorded in the United States and most international areas, especially in Europe, where the largest part of our international activity occurs. Worldwide sales volume was higher for most major products.

Operating profit in 1989 was $44 million, a decrease of 4% as compared with the prior year. The gross margin ratio increased to 21.3% from 20.9% in 1988. Increased volumes and a favorable effect from liquidation of LIFO inventory quantities acquired at lower costs prevailing in prior years were partially offset by increased manufacturing costs. Selling, administrative and other expenses increased 10%, reflecting increased selling costs due to higher sales and higher administrative costs. As a percentage of sales, however, selling, administrative and other expenses at 8.6% was approximately the same as 1988. Other expenses — net in 1989 included a charge of $4 million representing costs associated with restructuring a facility in Canada. Operating costs in 1990 are expected to benefit from the shutdown in January 1990 of a high-cost production facility in Puerto Rico and the restructuring of the Canadian facility.

In 1988, sales increased by 17% to $723 million as compared with the prior year. Increased shipments were recorded in all major geographic areas. Sales were helped by the effect of the weaker U.S. dollar on currency translation rates.

Operating profit in 1988 also increased over the prior year, reaching $46 million. The gross margin ratio increased slightly to 20.9% from 20.4% in 1987 as a result of higher volumes and operating rates. More significantly, management's continued efforts at cost containment and profit improvement resulted in a reduction in selling, administrative and other expenses of $11 million. The ratio of selling, administrative and other expenses to sales fell dramatically to 8.7% in 1988 from 11.9% in 1987.

Sales increased in 1987 to $619 million, with increases reported in all of the segment's geographic areas. Increased graphite electrode volumes resulting from higher electric arc furnace steel production were offset in part by weak product pricing due to overcapacity.

In 1987, operating profit aggregated $20 million. The relatively low gross margin ratio in 1987 of 20.4% was largely the result of a poor pricing environment. Also adversely affecting operating profit was an increase in selling, administrative and other expenses.

Dollar amounts in millions	1989	1988	1987
Sales	$ 782	$ 723	$ 619
% of UCC Consolidated	9%	9%	9%
Operating profit	$ 44	$ 46	$ 20
% of UCC Consolidated	4%	3%	3%
Number of employees (year-end)	6,024	6,482	5,843

SEGMENT ANALYSIS: GENERAL EXPENSES — NET

General expenses — net includes unallocated corporate staff costs, the cost of accounts receivable discounting and other non-interest financing charges, corporate legal expenses, corporate realignment costs and certain interest income as well as income and expenses related to discontinued or non-core businesses. The Corporation's principal non-core businesses include domestic mining and milling of uranium and vanadium through Umetco Minerals Corporation and the mining and smelting of chrome by unconsolidated subsidiaries in Zimbabwe. In addition, the Corporation holds a 50% interest in KEMET Electronics Corporation, a manufacturer of electronic capacitors.

COSTS RELATING TO PROTECTION OF THE ENVIRONMENT

Worldwide costs relating to environmental protection continue to grow significantly due both to the Corporation's ongoing commitment to vigorous internal standards and to more stringent laws and regulations. In 1989, worldwide expenses related to environmental protection, including cash expenditures and accruals for waste site remedial activities, totaled $179 million, an increase of $20 million, or 13% over 1988. In 1989 and 1988, approximately 76% and 84%, respectively, of the total expense relates to, and has been charged against, Chemicals & Plastics operations. In addition, worldwide capital expenditures relating to environmental protection in 1989 aggregated $50 million, an increase of $11 million over the prior year.

Estimates of the future cost of environmental protection are necessarily imprecise due to numerous uncertainties including, among other issues, the impact of new laws and regulations, the availability of new technologies, the applicability of insurance coverage and the identification of new hazardous waste sites. The Corporation estimates that worldwide expenses for environmental protection, expressed in 1989 dollars, should average about $200 million annually over the next five years, 1990-1994. Worldwide capital expenditures for environmental protection, also expressed in 1989 dollars, are expected to average about $110 million annually over the same period.

INTEREST EXPENSE

Interest expense totaled $304 million in 1989, virtually the same as the $300 million of 1988. The 1988 expense represented a decline of 4% from the comparable 1987 amount of $311 million. The decrease was attributable to lower average domestic borrowings. Interest expense for 1988 and 1987 has been changed for reclassification of foreign currency gains on debt incurred by affiliates operating in Latin American hyperinflationary countries, principally Brazil, from other income to interest expense.

PROVISION FOR INCOME TAXES

The effective tax rate for 1989 decreased to 32.3% as compared to 37.6% in 1988, reflecting increased Foreign Sales Corporation earnings as a proportion of total pre-tax income and reversals of deferred tax credits established at higher rates in prior years. The 1988 tax rate increased significantly as compared with the 1987 rate of 31.9%. In addition to the reversal of deferred tax benefits established at higher tax rates in prior years, the 1988 effective rate included increased state and local income taxes, the elimination of tax credits, and the impact of untaxed currency translation losses. The 1987 rate also benefited by adjustments to 1986 sales of businesses. Provision for income taxes in 1988 and 1987 has been changed for reclassification of foreign currency gains on prior period tax liabilities of affiliates operating in Latin American hyperinflationary countries, principally Brazil, from other income to provision for income taxes.

Statement of Financial Accounting Standards No. 96, Accounting for Income Taxes, effective for years beginning after December 15, 1991, will significantly modify the accounting for income taxes. The Corporation plans to adopt the new standard in 1992. There would not have been a material effect on the financial statements if the standard had been adopted in 1989.

MINORITY INTEREST AND EQUITY COMPANY EARNINGS

Minority stockholders' share of income totaled $59 million in 1989 down 8% from the prior year, mainly due to lower Chemicals & Plastics income from our 75% owned Canadian subsidiary. Minority share increased 60% in 1988. A full year of dividends on preferred stock of Union Carbide Finance Corporation was included in minority share in 1988 compared with dividends for a partial year in 1987 (operations commenced in September 1987). Minority share also increased in 1988 as a result of higher income from both the Canadian (Chemicals & Plastics and Industrial Gases) and 52% owned Brazilian (Industrial Gases) subsidiaries. Minority share increased 25% in 1987 to $40 million. Higher income from industrial gas operations of a Brazilian subsidiary and dividends on preferred stock of Union Carbide Finance Corporation accounted for much of the increase.

At $38 million, the Corporation's share of income of corporate ventures carried at equity in 1989 was roughly that of 1988. Increases from Industrial Gases and Carbon Products corporate ventures in Mexico were offset by a decline in income from KEMET Electronics Corporation. Equity income in 1988 was well over twice the level of income in 1987. Substantially improved results from corporate ventures in our core business groups in Mexico, Japan (Chemicals & Plastics) and Spain (Industrial Gases), as well as excellent performance from KEMET Electronics Corporation, all contributed to this increase. Equity income in 1987 was $14 million, the same as in 1986. Improved earnings of Canadian affiliates and income from KEMET Electronics Corporation were offset by increased losses of an affiliate in Mexico.

LIQUIDITY, CAPITAL RESOURCES AND OTHER FINANCIAL DATA

CASH FLOW FROM OPERATIONS

Cash flow from operations decreased to $665 million in 1989 from $932 million in 1988 mainly as a result of a decline in net income as well as a cash payout of $256 million, net of insurance proceeds, associated with settlement of the Bhopal litigation. Net working capital, exclusive of Bhopal effects and sales of businesses, increased from the beginning of the year. Inventory reductions were more than offset by an increase in receivables and decreases in accounts and taxes payable. Cash flow from operations in 1988 more than doubled from 1987 levels, largely as a result of improved income from operations partially offset by increases in accounts receivable and inventories related to increased sales activity.

CASH FLOW USED FOR INVESTING

Cash flow used for investing includes capital expenditures and investments, offset by proceeds from the sale of assets and businesses. Net expenditures associated with investing activities increased moderately to $548 million from $531 million in 1988, as a result of proceeds from the sale of the urethane polyols and propylene glycols businesses and other assets, which largely offset a $114 million increase in 1989 capital expenditures to $785 million. Major domestic capital projects in 1989 included reactivation of an olefins unit at Taft, La., and a new polyethylene unit at Seadrift, Tex. In Brazil, major expenditures were made on a number of Industrial Gases projects. Capital expenditures in 1988 totaled $671 million, a 34% increase over 1987. Expenditures in 1987 were $502 million. Approximately 70% of capital spending for the last three years was in the United States and Puerto Rico. Of expenditures over the last three years, approximately 47% were directed to new capacity, 39% to cost reduction and replacement and 14% to environmental, safety and health facilities.

At December 31, 1989, the cost of completing authorized construction projects was estimated to be $547 million, of which $40 million is covered by firm commitments.

CASH FLOW USED FOR FINANCING

Cash flow used for financing includes UCC and minority stockholder dividends and debt reductions offset in part by proceeds from sales of common stock pursuant to the Corporation's dividend reinvestment and employee savings and incentive programs. As a result of reduced net debt paydowns in 1989, cash flow used for financing decreased to $84 million as compared with $438 million in the prior year and $282 million in 1987. Net debt reductions exclusive of foreign currency effects, aggregated $20 million in the current year as contrasted to $376 million and $351 million in 1988 and 1987, respectively. From a peak of $5.6 billion at March 31, 1986, debt has been reduced by a total of $2.9 billion at year-end 1989. During this same period, the Corporation's ratio of total debt to total capital has been reduced from 78.7% to 47.8%.

At December 31, 1989, Union Carbide had $1.2 billion of unused borrowing capability under existing major bank credit agreements.

Certain consolidated domestic and international subsidiaries are restricted by borrowing arrangements, regulatory restraints or the laws of national and local governments as to their ability to transfer funds to the parent in the form of cash dividends, loans or advances. At December 31, 1989, the amount of such restricted net assets was $308 million. In addition, there are similar restrictions on our unconsolidated subsidiaries of $52 million.

EFFECTS OF INFLATION

The impact of inflation on the Corporation's operations and financial condition has been less significant in recent years due to lower rates of inflation. In addition, the Corporation uses the LIFO method of accounting for a majority of the value of its inventories, which results in cost of sales approximating current costs. However, the charge for depreciation does not reflect current cost, which would have been about 20% higher than historical amounts for the most recent three years. In general, the Corporation believes that its programs are designed to monitor the effects of inflation and to take necessary steps to minimize its effect on operations. These steps include cost reduction and productivity improvement programs, timely price increases within the constraints of highly competitive markets and investment in more efficient facilities and production processes.

DEBT RATIOS

Total debt outstanding at year-end for the past three years was:

Dollar amounts in millions	1989	1988	1987
Domestic	$1,930	$2,000	$2,298
International	805	757	882
Total	$2,735	$2,757	$3,180

Year-end ratios of total debt to total capital were:

	1989	1988	1987
Debt ratio	47.8%	53.2%	63.6%

Total debt includes short-term debt, long-term debt and the current portion of long-term debt; total capital consists of total debt plus minority stockholders' equity in consolidated subsidiaries and UCC stockholders' equity.

ANALYSIS OF CHANGE IN PER SHARE EARNINGS

Dollars per share	'89 vs. '88	'88 vs. '87
Primary earnings per share, 1988 and 1987	$ 4.88	$ 1.76
Total gross margin	+0.12	+3.70
Research and development	-0.10	—
Selling, administrative and other expenses	-0.54	-0.21
Depreciation	-0.11	-0.05
Interest on long-term and short-term debt	-0.02	+0.06
Other expenses—net	-0.39	+0.26
Effective income tax rate	+0.34	-0.47
Minority stockholders' share of income	+0.03	-0.18
UCC share of income of corporate ventures carried at equity	+0.01	+0.17
Increase in shares outstanding	-0.15	-0.16
Net change	-0.81	+3.12
Primary earnings per share, 1989 and 1988	$ 4.07	$ 4.88

INDUSTRY SEGMENTS

(Millions of dollars)

Sales	1989	1988	1987
Chemicals & Plastics	$5,613	$5,525	$4,325
Industrial Gases	2,349	2,076	1,872
Carbon Products	782	723	619
Other	—	—	98
Total UCC Consolidated	$8,744	$8,324	$6,914
Operating profit	**1989**	**1988**	**1987**
Chemicals & Plastics	$1,003	$1,204	$ 534
Industrial Gases	222	230	237
Carbon Products	44	46	20
Other	—	—	(14)
Total UCC Consolidated	$1,269	$1,480	$ 777
Identifiable assets	**1989**	**1988**	**1987**
Chemicals & Plastics	$4,068	$3,995	$3,506
Industrial Gases	2,771	2,599	2,490
Carbon Products	815	814	829
Other	521	674	533
Total UCC Consolidated	$8,175	$8,082	$7,358
Capital	**1989**	**1988**	**1987**
Chemicals & Plastics	$2,877	$2,748	$2,439
Industrial Gases	2,104	2,001	1,922
Carbon Products	636	636	659
All other	107	(207)	(22)
Total UCC Consolidated	$5,724	$5,178	$4,998
Depreciation	**1989**	**1988**	**1987**
Chemicals & Plastics	$ 252	$ 243	$ 239
Industrial Gases	189	176	168
Carbon Products	48	43	40
Other	9	11	16
Total UCC Consolidated	$ 498	$ 473	$ 463
Capital expenditures	**1989**	**1988**	**1987**
Chemicals & Plastics	$ 457	$ 372	$ 190
Industrial Gases	255	247	272
Carbon Products	47	44	37
Other	26	8	3
Total UCC Consolidated	$ 785	$ 671	$ 502

GEOGRAPHIC SEGMENTS

(Millions of dollars)

Sales	1989	1988	1987
United States & Puerto Rico	$ 5,793	$5,758	$4,778
Canada	463	429	298
Europe	1,053	929	876
Latin America	961	777	638
Far East & Other	474	431	324
International operations	2,951	2,566	2,136
Total UCC Consolidated	$ 8,744	$8,324	$6,914
Operating profit	**1989**	**1988**	**1987**
United States & Puerto Rico	$ 917	$1,142	$ 567
Canada	106	113	57
Europe	73	61	30
Latin America	144	142	106
Far East & Other	29	22	16
International operations	352	338	209
Inter-segment eliminations	—	—	1
Total UCC Consolidated	$ 1,269	$1,480	$ 777
Identifiable assets	**1989**	**1988**	**1987**
United States & Puerto Rico	$ 5,707	$5,507	$4,709
Canada	803	770	618
Europe	1,406	1,228	1,238
Latin America	940	822	776
Far East & Other	333	409	426
International operations	3,482	3,229	3,058
Inter-segment eliminations	(1,014)	(654)	(409)
Total UCC Consolidated	$ 8,175	$8,082	$7,358

Beginning in 1989, operating profit has been adjusted to (1) exclude foreign currency gains on debt and prior period tax liabilities of international affiliates operating in hyperinflationary countries in Latin America, principally Brazil (see Note 1 on page 24), (2) include investment income of operating affiliates consistent with the Corporation's realignment as a holding company and (3) include an allocable share of corporate overhead expenses. In addition, certain reclassifications have been made to conform the segment data to the realigned structure of the worldwide businesses. Prior year amounts have been restated to conform to the 1989 presentation. These reclassifications and adjustments have no impact on UCC's net income as previously reported.

Segment sales as presented in the preceding pages are to customers. Transfers between segments were as follows:

Millions of dollars	1989	1988	1987
INDUSTRY SEGMENTS			
From Chemicals & Plastics	$ 22	$ 14	$ 15
From Industrial Gases	32	36	33
From Carbon Products	20	3	3
Total between segments	$ 74	$ 53	$ 51
GEOGRAPHIC SEGMENTS			
From U.S. & Puerto Rico:			
Chemicals & Plastics	$587	$519	$405
Industrial Gases	27	25	24
Carbon Products	36	40	31
	650	584	460
From other geographic segments	178	170	137
Total between segments	$828	$754	$597

Products are transferred between segments at the estimated market value of the products.

The following table reconciles segment operating profit with the consolidated financial statements. (The term *operating profit* is used as defined in Statement of Financial Accounting Standards No. 14.)

Millions of dollars	1989	1988	1987
Total segment operating profit	$1,269	$1,480	$777
Less: General expenses—net	87	76	87
Interest on long-term and short-term debt	304	300	311
Income before provision for income taxes	$ 878	$1,104	$379

The following table reconciles total identifiable assets with the consolidated financial statements:

Millions of dollars	1989	1988	1987
Total identifiable assets	$8,175	$8,082	$7,358
Investments and advances	164	155	267
Corporate assets	207	204	267
Total UCC Consolidated	$8,546	$8,441	$7,892

Operating profit includes the Corporation's share of income before income taxes from partnership joint ventures carried at equity as follows:

Millions of dollars	1989	1988	1987
Chemicals & Plastics	$82	$95	$16
Industrial Gases	3	1	(1)

The Corporation's investments in corporate ventures carried at equity and non-consolidated partnership joint ventures have been attributed to industry segment identifiable assets. The Corporation's most significant Chemicals & Plastics unincorporated ventures include Petromont and Company, Limited (a partnership interest of a Canadian subsidiary), World Ethanol Company, UOP and a Carbide/Shell polypropylene partnership.

The 1989 operating profit of the Chemicals & Plastics and United States & Puerto Rico segments includes a gain of $101 million from the sale of the worldwide urethane polyols and propylene glycols businesses and a charge of $90 million resulting from a write-down to net realizable value of the polysilicon business. The 1988 operating profit of the Chemicals & Plastics and Canada segments includes a $13 million charge for impairment of assets related to a Canadian film products business.

The 1989 operating profit of the Industrial Gases and United States & Puerto Rico segments includes a $73 million charge for restructuring costs, and the 1988 operating profit for these segments includes a $10 million charge for impairment of assets related to an enhanced oil recovery project.

Millions of dollars	1Q	2Q	3Q	4Q	Year
1989					
Net sales	$2,241	$2,277	$2,141	$2,085	$8,744
Cost of sales[a]	1,476	1,528	1,435	1,436	5,875
Depreciation	124	124	124	126	498
Net income	201	186	139[b]	47[c]	573
1988					
Net sales	$1,947	$2,130	$2,108	$2,139	$8,324
Cost of sales[a]	1,305	1,401	1,386	1,388	5,480
Depreciation	117	119	114	123	473
Net income	101	187	213	161[d]	662

Dollars per share	1Q	2Q	3Q	4Q	Year
1989					
Primary net income	$ 1.44	$ 1.33	$ 0.98[b]	$ 0.33[c]	$ 4.07
Fully diluted net income	1.37	1.27	0.95[b]	0.33[c,e]	3.92
Dividends	0.25	0.25	0.25	0.25	1.00
Market price (high)[f]	33.25	31.75	31.50	28.63	33.25
Market price (low)[f]	25.13	25.63	26.00	22.75	22.75
1988					
Primary net income	$ 0.75	$ 1.39	$ 1.56	$ 1.17[d]	$ 4.88
Fully diluted net income	0.73	1.33	1.49	1.12[d]	4.66
Dividends	0.375	0.375	0.20	0.20	1.15
Market price (high)[f]	25.63	25.13	25.50	28.38	28.38
Market price (low)[f]	19.88	17.00	20.88	23.25	17.00

a Amounts differ from previously reported amounts due to a reclassification of certain costs from *Selling, administrative and other expenses*.

b Includes an after-tax gain of $63 million, or $0.44 per share primary ($0.42 per share fully diluted), from the sale of the worldwide urethane polyols and propylene glycols businesses and an after-tax charge of $56 million, or $0.39 per share primary ($0.37 per share fully diluted), resulting from a write-down to net realizable value of the polysilicon business.

c Includes an after-tax charge of $56 million, or $0.40 per share primary and fully diluted, mainly representing facility shutdown costs and severance and relocation benefits associated with restructuring the U.S. bulk and packaged gas businesses (see Note 4 on page 25).

d Includes an after-tax charge of $58 million, or $0.43 per share primary ($0.40 per share fully diluted), associated with the settlement of Bhopal litigation (see Note 16 on page 32).

e The fully diluted per share amount is antidilutive and, accordingly, primary and fully diluted per share amounts are identical.

f Prices are based on New York Stock Exchange composite transactions.

Dollar amounts in millions (except per share figures)	1989	1988*	1987*	1986*	1985*
From the Income Statement					
Net sales	$ 8,744	$ 8,324	$ 6,914	$ 6,343	$ 6,390
Cost of sales	5,875	5,480	4,788	4,354	4,607
Research and development	181	159	159	148	181
Selling, administrative and other expenses	924	807	764	729	725
Depreciation	498	473	463	453	470
Interest on long-term and short-term debt	304	300	311	529	243
Other expenses (income)	84	1	50	(77)	1,076
Pre-tax income (loss) from continuing operations	878	1,104	379	207	(912)
Provision (credit) for income taxes	284	415	121	59	(404)
Income (loss) from continuing operations	573	662	232	130	(503)
Income (loss) from discontinued operations	—	—	—	5	(96)
Gain on disposals of discontinued operations	—	—	—	564	—
Income (loss) before extraordinary items and cumulative effect of change in accounting principle	573	662	232	699	(599)
Extraordinary items	—	—	—	(473)	18
Cumulative effect of change in accounting principle for reversion of surplus pension funds	—	—	—	270	—
Net income (loss)	573	662	232	496	(581)
Per share					
Primary — Income (loss) from continuing operations	4.07	4.88	1.76	1.25	(2.40)
— Net income (loss)	4.07	4.88	1.76	4.78	(2.78)
Fully diluted — Income (loss) from continuing operations	3.92	4.66	1.75	1.24	(2.40)
— Net income (loss)	3.92	4.66	1.75	4.75	(2.78)
From the Balance Sheet (at year-end)					
Net current assets	$ 459	$ 428	$ 744	$ 496	$ 211
Total assets	8,546	8,441	7,892	7,571	9,670
Long-term debt	2,080	2,295	2,863	3,057	1,713
Total capital	5,724	5,178	4,998	4,877	7,962
UCC stockholders' equity	2,383	1,836	1,247	1,005	4,019
UCC stockholders' equity per share	16.83	13.34	9.43	7.87	19.82
Other Data					
Dividends	$ 140	$ 155	$ 195	$ 144	$ 237
Dividends per share	1.00	1.15	1.50	1.50	1.13
Shares outstanding (thousands at year-end)	141,578	137,602	132,248	127,695	202,821
Market price per share — high**	33.25	28.38	32.50	33.17	24.75
Market price per share — low**	22.75	17.00	15.50	18.75	12.00
Capital expenditures	785	671	502	524	501
Number of employees — continuing operations (at year-end)	45,987	43,992	43,119	50,292	52,117
Selected Financial Ratios					
Total debt/total capital (at year-end)	47.8%	53.2%	63.6%	72.1%	38.7%
Net income/average UCC stockholders' equity	27.2%	43.0%	20.6%	19.7%	—
Dividends/net income	24.4%	23.4%	84.1%	29.0%	—

*Certain amounts from the Income Statement have been reclassified to conform to the 1989 presentation (see Note 1 on page 24).

**Prices are based on New York Stock Exchange composite transactions.

Primary earnings per share are based on weighted average number of common and common equivalent shares outstanding during the year. Fully diluted earnings per share are calculated assuming conversion of convertible subordinated debentures due 2012. Fully diluted per share amounts for 1985 are antidilutive and, accordingly, primary and fully diluted per share amounts are identical. *Net current assets* consists of total current assets less total current liabilities. *Total debt* consists of short-term debt, long-term debt and current installments of long-term debt. *Total capital* consists of *Total debt* plus *Minority stockholders' equity in consolidated subsidiaries* and *UCC stockholders' equity*.

Millions of dollars (except per share figures), year ended December 31,	1989	1988*	1987*
Net Sales	$8,744	$8,324	$6,914
Cost of sales, exclusive of depreciation shown separately below	5,875	5,480	4,788
Research and development	181	159	159
Selling, administrative and other expenses	924	807	764
Depreciation	498	473	463
Interest on long-term and short-term debt	304	300	311
Other expenses — net	84	1	50
Income Before Provision for Income Taxes	878	1,104	379
Provision for income taxes	284	415	121
Income of Consolidated Companies	594	689	258
Less: Minority stockholders' share of income	59	64	40
Plus: UCC share of income of corporate ventures carried at equity	38	37	14
Net Income	$ 573	$ 662	$ 232
Earnings Per Share			
Primary	$ 4.07	$ 4.88	$ 1.76
Fully diluted	$ 3.92	$ 4.66	$ 1.75
Dividends Declared Per Share	$ 1.00	$ 1.15	$ 1.50

*Certain amounts have been reclassified to conform to the 1989 presentation (see Note 1).

The Notes to Financial Statements on pages 24 through 32 should be read in conjunction with this statement.

CONSOLIDATED BALANCE SHEET
UNION CARBIDE CORPORATION AND SUBSIDIARIES

Millions of dollars at December 31,	1989	1988
Assets		
Cash and cash equivalents	$ 142	$ 146
Notes and accounts receivable	1,474	1,413
Inventories		
Raw materials and supplies	262	275
Work in process	207	191
Finished goods	463	566
	932	1,032
Prepaid expenses	239	292
Total Current Assets	2,787	2,883
Property, plant and equipment	9,530	9,009
Less: Accumulated depreciation	4,946	4,593
Net Fixed Assets	4,584	4,416
Companies carried at equity	727	680
Other investments and advances	135	139
Total Investments and Advances	862	819
Other assets	313	323
Total Assets	$8,546	$8,441
Liabilities and Stockholders' Equity		
Accounts payable	$ 689	$ 756
Short-term debt	445	270
Payments due within one year on long-term debt	210	192
Accrued income and other taxes	146	193
Other accrued liabilities	838	1,044
Total Current Liabilities	2,328	2,455
Long-term debt	2,080	2,295
Other long-term obligations	342	355
Deferred credits	807	915
Minority stockholders' equity in consolidated subsidiaries	606	585
UCC stockholders' equity		
Common stock		
Authorized—500,000,000 shares		
Issued—141,577,588 shares (214,409,782 shares in 1988)	142	214
Additional paid-in capital	38	1,322
Equity adjustment from foreign currency translation	(90)	(106)
Retained earnings	2,293	2,605
	2,383	4,035
Less: Treasury stock, at cost—none in 1989 (76,808,221 shares in 1988)	—	2,199
Total UCC Stockholders' Equity	2,383	1,836
Total Liabilities and Stockholders' Equity	$8,546	$8,441

The Notes to Financial Statements on pages 24 through 32 should be read in conjunction with this statement.

Increase (Decrease) in Cash and Cash Equivalents

Millions of dollars, year ended December 31,	1989	1988[a]	1987[a]
Operations			
Net income	$ 573	$ 662	$ 232
Non-cash charges (credits) to net income			
Depreciation	498	473	463
Deferred income taxes	51	114	(59)
Other non-cash charges (credits)	120	(6)	38
Investing credits to net income	(107)	(24)	(52)
Working capital[b]	(417)	137	(284)
Long-term assets and liabilities	(53)	(424)	123
Cash flow from operations	665	932	461
Investing			
Capital expenditures	(785)	(671)	(502)
Investments	(89)	(79)	(120)
Redemption/sale of assets	326	219	352
Cash flow used for investing	(548)	(531)	(270)
Financing			
Short-term debt	182	62	(114)
Net borrowings — principally major bank credit agreements	33	(190)	(888)
Other long-term borrowings	624	396	1,145
Preferred stock issued by a consolidated subsidiary	—	—	244
Issuance of common stock	96	108	78
Long-term debt reductions	(859)	(644)	(494)
Minority transactions and other	(20)	(15)	(58)
Cash dividends	(140)	(155)	(195)
Cash flow used for financing	(84)	(438)	(282)
Effect of exchange rate changes on cash and cash equivalents	(37)	(18)	(7)
Change in cash and cash equivalents	(4)	(55)	(98)
Cash and cash equivalents beginning-of-year	146	201	299
Cash and cash equivalents end-of-year	$ 142	$ 146	$ 201

a Certain amounts have been reclassified to conform to the 1989 presentation (see Note 1).

b Net change in working capital by component (excluding cash and cash equivalents, deferred income taxes, and short-term debt):

	1989	1988	1987
(Increase) decrease in current assets			
Notes and accounts receivable	$(102)	$(215)	$(249)
Inventories	54	(246)	(132)
Prepaid expenses	17	(1)	(14)
Increase (decrease) in payables and accruals	(386)	599	111
Working capital	$(417)	$ 137	$(284)

The Notes to Financial Statements on pages 24 through 32 should be read in conjunction with this statement.

	1989		1988		1987	
	Shares (in thousands)	Millions of dollars	Shares (in thousands)	Millions of dollars	Shares (in thousands)	Millions of dollars
Common Stock						
Balance at January 1	214,410	$ 214	209,071	$ 209	205,301	$ 205
Issued:						
For the Dividend Reinvestment and Stock Purchase Plan	869	1	3,218	3	1,517	2
For employee savings and incentive plans	2,523	3	2,121	2	2,049	2
For conversion of convertible debentures	—	—	—	—	204	—
Retirement of treasury shares	(76,224)	(76)	—	—	—	—
Balance at December 31	141,578	$ 142	214,410	$ 214	209,071	$ 209
Treasury Stock						
Balance at January 1	76,808	$ 2,199	76,823	$ 2,200	77,606	$ 2,222
Issued:						
For the Dividend Reinvestment and Stock Purchase Plan	(11)	—	—	—	(485)	(14)
For employee savings and incentive plans	(573)	(16)	(15)	(1)	(293)	(8)
For conversion of convertible debentures	—	—	—	—	(5)	—
Retirement of treasury shares	(76,224)	(2,183)	—	—	—	—
Balance at December 31	—	$ —	76,808	$ 2,199	76,823	$ 2,200
Additional Paid-In Capital						
Balance at January 1		$ 1,322		$ 1,215		$ 1,144
Issued:						
For the Dividend Reinvestment and Stock Purchase Plan		22		69		33
For employee savings and incentive plans		53		38		30
For conversion of convertible debentures		—		—		8
Retirement of treasury shares		(1,359)		—		—
Balance at December 31		$ 38		$ 1,322		$ 1,215
Equity Adjustment from Foreign Currency Translation						
Balance at January 1		$ (106)		$ (75)		$ (183)
Translation and other adjustments		16		(31)		108
Balance at December 31		$ (90)		$ (106)		$ (75)
Retained Earnings						
Balance at January 1		$ 2,605		$ 2,098		$ 2,061
Net income		573		662		232
Cash dividends		(140)		(155)		(195)
Retirement of treasury shares		(748)		—		—
Adjustment to the 1986 Special Cash Distribution		3		—		—
Balance at December 31		$ 2,293		$ 2,605		$ 2,098

The Notes to Financial Statements on pages 24 through 32 should be read in conjunction with this statement.

INDEX

The subjects covered by the Notes to Financial Statements are found on the following pages:

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

PRINCIPLES OF CONSOLIDATION—The consolidated financial statements include the accounts of all significant subsidiaries except Union Carbide India Limited and two subsidiaries in Zimbabwe, which are included in *Other investments and advances*. All significant intercompany transactions have been eliminated in consolidation. Investments in significant companies 20% to 50% owned and partnerships are carried at equity in net assets. In the *Consolidated Statement of Income*, Union Carbide's share of the net income of the 20% to 50% owned companies is reported under the caption *UCC share of income of corporate ventures carried at equity* and pre-tax partnership income is included in *Other expenses—net*. Other investments are carried generally at cost or less.

FOREIGN CURRENCY TRANSLATION—Generally, except for Latin America, unrealized gains and losses resulting from translating foreign subsidiaries' assets and liabilities into U.S. dollars are accumulated in an equity account on the balance sheet until such time as the subsidiary is sold or substantially or completely liquidated. Translation gains and losses relating to operations of subsidiaries in Latin America, where hyperinflation exists, are included in the income statement.

CASH EQUIVALENTS—The Corporation considers cash equivalents to be all highly liquid investments that are readily convertible to known amounts of cash and so near their maturity that they present insignificant risk of changes in value because of changes in interest rates.

INVENTORIES—Inventories are stated at cost or market, whichever is lower. These amounts do not include depreciation, the impact of which is not significant to the financial statements. Cost is determined generally on the "last-in, first-out" (LIFO) method for North American companies. The "average cost" method is used by most other subsidiaries.

Approximately 59% of inventory amounts before application of the LIFO method at December 31, 1989 (53% at December 31, 1988) has been valued on the LIFO basis. It is estimated that if inventories had been valued at current costs, they would have been approximately $466 million and $445 million higher than reported at December 31, 1989, and December 31, 1988, respectively.

FIXED ASSETS AND DEPRECIATION—Fixed assets are carried at cost. Expenditures for replacements are capitalized and the replaced items are retired. Gains and losses from the sale of property are included in income.

Depreciation is calculated on a straight-line basis. The Corporation and its subsidiaries generally use accelerated depreciation methods for tax purposes where appropriate.

PATENTS, TRADEMARKS AND GOODWILL—Amounts paid for purchased patents and newly acquired subsidiaries in excess of the fair value of the net assets of such subsidiaries have been charged to patents, trademarks and goodwill. The portion of such amounts determined to be attributable to patents is amortized over their remaining lives while trademarks and goodwill are amortized over the estimated period of benefit, generally five to forty years.

RESEARCH AND DEVELOPMENT—Research and development costs are charged to expense as incurred. Depreciation expense applicable to research and development facilities and equipment is included in *Depreciation* in the income statement ($12 million in 1989 and $13 million in 1988 and 1987).

INCOME TAXES—Provision has been made for deferred income taxes where differences exist between the period in which transactions affect taxable income and the period in which they enter into the determination of income in the financial statements.

RETIREMENT PROGRAMS — The cost of pension benefits under the U.S. Retirement Program is determined by an independent actuarial firm using the "projected unit credit" actuarial cost method with an unrecognized net asset at January 1, 1986, amortized over 15 years. Contributions to this program are made in accordance with the regulations of the Employee Retirement Income Security Act of 1974.

In 1988, the Corporation adopted Statement of Financial Accounting Standards No. 87, Employers' Accounting for Pensions (SFAS 87), for defined benefit plans outside the U.S. (see Note 14). Previously, the Corporation had adopted SFAS 87 for its U.S. retirement program.

EARNINGS PER SHARE — Primary earnings per share is computed by dividing income by the weighted average number of shares outstanding during the year and common stock equivalents related to dilutive stock options. Fully diluted earnings per share is computed by dividing adjusted net income by the weighted average number of shares outstanding, common stock equivalents related to dilutive stock options, and shares issuable upon conversion of debentures.

The number of shares used to compute earnings per share amounts was as follows:

	1989	1988	1987
Primary	140,827,913	135,708,985	131,396,578
Fully diluted	150,546,223	145,663,685	139,002,374

RECLASSIFICATION — Beginning in 1989, foreign currency gains on debt and prior period tax liabilities of affiliates operating in hyperinflationary countries in Latin America have been included in *Interest on long-term and short-term debt* and *Provision for income taxes*, respectively, rather than in *Other expenses — net*. Prior year amounts have been reclassified to conform to the 1989 presentation. This basis of presentation acknowledges that foreign currency gains on debt and prior period taxes payable, in those Latin American countries in which the Corporation operates, have historically been offset by related interest and tax expense. Additionally, certain other prior year amounts in the Consolidated Statements of Income and Cash Flows have been reclassified to conform to the 1989 presentation.

2. HOLDING COMPANY FORMATION

Effective July 1, 1989, Union Carbide Corporation became a holding company through a binding share exchange in which each outstanding share of the predecessor company was exchanged automatically for one share of the holding company. Following the exchange, the holding company took the name "Union Carbide Corporation" and the predecessor company changed its name from "Union Carbide Corporation" to "Union Carbide Chemicals and Plastics Company Inc." ("UCC&P Inc."). UCC&P Inc. is a wholly owned subsidiary of the holding company. Effective January 1, 1989, Union Carbide Industrial Gases Inc. and UCAR Carbon Company Inc. became wholly owned subsidiaries of UCC&P Inc. as part of the ongoing corporate realignment.

3. SEGMENT INFORMATION

Audited industry and geographic segment data are presented in *Segment Data* on page 16.

Union Carbide's businesses and products are described on pages 8 through 13.

4. OTHER EXPENSES — NET

The following is an analysis of *Other expenses — net:*

Millions of dollars	1989	1988	1987
Investment income (principally from short-term investments)	$ (76)	$ (69)	$(47)
Foreign currency adjustments[a]	127	102	74
Restructuring and realignment costs[b]	83	—	—
Special litigation costs[c]	—	48	65
Sales and disposals of businesses and other assets[d]	(111)	(33)	(19)
Partnership income	(85)	(96)	(15)
Other[e]	146	49	(8)
	$ 84	$ 1	$ 50

a Excludes for 1989, $110 million of foreign currency net gains on Latin American debt ($101 million in 1988 and $72 million in 1987) and $28 million of foreign currency net gains on Latin American prior period taxes payable ($24 million in 1988 and $12 million in 1987). See Note 1.

b Mainly represents facility shutdown costs and severance and relocation benefits associated with restructuring the U.S. bulk and packaged gas businesses of Union Carbide Industrial Gases. Also included are costs involved in completing the worldwide realignment of the Corporation's core businesses as subsidiaries, and the cost of restructuring a Carbon Products facility in Canada.

c Represents accruals to cover reserves for litigation contingencies, including product liability, patents, trade regulation, and the Bhopal litigation (see Note 16).

d Includes for 1989 a gain of $96 million from the sale of the worldwide urethane polyols and propylene glycols businesses. Includes for 1988 a gain of $20 million from sales of securities by Canadian subsidiaries.

e Includes for 1989 a $90 million write-down to net realizable value of the polysilicon business. Includes for 1988 a $13 million charge for impairment of assets related to a Canadian film products business and a $10 million charge for impairment of assets related to an enhanced oil recovery project. Includes for 1987 a $14 million write-down of Canadian subsidiaries' investments in securities. Additionally, interest income and other miscellaneous income and expense items are included in the amounts for all years presented.

5. INTEREST COSTS

The following is an analysis of *Interest on long-term and short-term debt:*

Millions of dollars	1989	1988	1987
Interest incurred on debt	$432	$419	$395
Less: Related foreign currency adjustments	110	101	72
Interest capitalized	18	18	12
	$304	$300	$311

6. INCOME TAXES

The following is an analysis of income tax expense:

Millions of dollars	1989 Current	1989 Deferred	1988 Current	1988 Deferred	1987 Current	1987 Deferred
U.S. Federal income taxes	$ 84	$ 47	$223	$ 46	$104	$ (49)
U.S. business and research and experimentation tax credits	(4)	—	(58)	57	—	(8)
U.S. state and local taxes based on income	26	—	30	—	3	—
Non-U.S. income taxes	127	4	106	11	73	(2)
	$233	$ 51	$301	$114	$180	$ (59)
Provision for income taxes	$284		$415		$121	

The following table summarizes the tax effects of timing differences included in the deferred portion of the provision for income taxes:

Millions of dollars	1989	1988	1987
U.S.			
Pension adjustments	$ 15	$ 39	$ (2)
Depreciation	(62)	(17)	19
Inventory—uniform capitalization	(4)	(7)	(24)
Deferred gain on sale of assets	(4)	(3)	28
Special litigation accrual	44	(15)	(12)
Write-offs/write-downs of assets	47	19	(18)
Business credits	—	57	(8)
Restructuring costs	(25)	—	—
Other, net	36	30	(40)
Non-U.S.			
Depreciation	7	10	14
Other, net	(3)	1	(16)
	$ 51	$114	$ (59)

The consolidated effective income tax rate was 32.3% in 1989, 37.6% in 1988 and 31.9% in 1987. An analysis of the difference between the *Provision for income taxes* and the amount computed by applying the statutory Federal income tax rate to income before provision for income taxes is as follows:

	1989 Millions of dollars	1989 % of pre-tax income	1988 Millions of dollars	1988 % of pre-tax income	1987 Millions of dollars	1987 % of pre-tax income
Tax at statutory Federal rate	$298	34.0	$376	34.0	$151	40.0
Taxes related to operations outside the United States	13	1.4	14	1.3	(2)	(0.6)
U.S. business and research and experimentation tax credits	(4)	(0.5)	(1)	(0.1)	(8)	(2.1)
U.S. state and local taxes based on income	17	1.9	20	1.8	2	0.5
Foreign Sales Corporation	(17)	(1.9)	(11)	(1.0)	(7)	(1.8)
Reversal of timing differences	(14)	(1.6)	32	2.9	6	1.5
Adjustments to 1986 sales of businesses	(2)	(0.2)	—	—	(9)	(2.4)
Other, net	(7)	(0.8)	(15)	(1.3)	(12)	(3.2)
	$284	32.3	$415	37.6	$121	31.9

The Corporation plans to adopt SFAS 96, Accounting for Income Taxes, in 1992. Had the new standard been adopted in 1989, there would not have been a material effect on 1989 net income, nor would there have been a material impact at the beginning of the year for the cumulative adjustment required upon implementation of the standard.

The following is a summary of the U.S. and Non-U.S. components of *Income Before Provision for Income Taxes:*

Millions of dollars	1989	1988	1987
Income before provision for income taxes:			
U.S.	$616	$ 792	$215
Non-U.S.	262	312	164
	$878	$1,104	$379

The Corporation provides for taxes on undistributed earnings of affiliates included in consolidated retained earnings to the extent that such earnings are planned to be remitted and not reinvested indefinitely. Undistributed earnings of affiliates intended to be reinvested indefinitely amounted to $1.1 billion at December 31, 1989.

7. SUPPLEMENTARY BALANCE SHEET DETAIL

Millions of dollars at December 31,	1989	1988
Notes and accounts receivable		
Trade[a]	$1,227	$1,241
Other	282	213
	1,509	1,454
Less: Allowance for doubtful accounts	35	41
	$1,474	$1,413
Fixed assets		
Land and improvements	$ 414	$ 415
Buildings	771	762
Machinery and equipment	7,747	7,361
Construction in progress and other	598	471
	$9,530	$9,009
Other assets		
Deferred charges	$ 174	$ 172
Long-term receivables	76	99
Patents, trademarks and goodwill	63	52
	$ 313	$ 323
Other accrued liabilities		
Accrued accounts payable	$ 305	$ 404
Payrolls	109	111
Bhopal settlement accrual	—	237
Other	424	292
	$ 838	$1,044
Other long-term obligations		
Accrued pension cost	$ 8	$ 41
Other	334	314
	$ 342	$ 355
Deferred credits		
Income taxes[b]	$ 634	$ 732
Deferred gain on sales of the Danbury Headquarters and Tarrytown properties	118	128
Other	55	55
	$ 807	$ 915
Equity adjustment from foreign currency translation (by geographic area)		
Canada	$ (22)	$ (27)
Europe	(45)	(62)
Far East & Other	(23)	(17)
	$ (90)	$ (106)

a Union Carbide sold certain receivables with recourse to various banks for proceeds of $621 million in 1989, $415 million in 1988 and $801 million in 1987. At December 31, 1989, approximately $28 million remains uncollected ($65 million in 1988). Of the 1989 amount, $14 million is included in contingent obligations ($27 million in 1988). See Note 16.

b Deferred income taxes related to current items are included in *Prepaid expenses* in the amount of $136 million in 1989 ($172 million in 1988).

8. SUPPLEMENTARY CASH FLOW DETAIL

INVESTING

Increase (decrease) in cash and cash equivalents

Millions of dollars	1989	1988	1987
REDEMPTION/SALE OF ASSETS			
Hedging activities—net	$ (1)	$ (10)	$ 27
Investments redeemed	66	162	25
Sale of fixed and other assets	261	67	300
	$ 326	$ 219	$ 352

FINANCING

Increase (decrease) in cash and cash equivalents

Millions of dollars	1989	1988	1987
SHORT-TERM DEBT			
Net change in short-term debt (maturities of three months or less)	$ 127	$ 70	$ 80
Borrowings	242	87	66
Reductions	(187)	(95)	(260)
	$ 182	$ 62	$ (114)
NET BORROWINGS—PRINCIPALLY MAJOR BANK CREDIT AGREEMENTS*			
Borrowings	$ 3,522	$ 727	$ 322
Reductions	(3,489)	(917)	(1,210)
	$ 33	$(190)	$ (888)
MINORITY TRANSACTIONS AND OTHER			
Redemption of preferred stock held by minority interest	$ —	$ —	$ (45)
Dividends to minority stockholders	(21)	(16)	(15)
Other	1	1	2
	$ (20)	$ (15)	$ (58)

CASH PAID FOR INTEREST AND INCOME TAXES

Millions of dollars	1989	1988	1987
Interest (net of amount capitalized)	$ 334	$ 405	$ 393
Income taxes	$ 288	$ 212	$ 74

*Includes money market loans supported by credit agreements.

NON-CASH INVESTING AND FINANCING ACTIVITIES

In 1988, the Corporation exchanged $284 million of net assets for equity positions in two joint ventures.

9. COMPANIES CARRIED AT EQUITY

The following are financial summaries of companies carried at equity:

	Partnerships		
Millions of dollars	1989	1988	1987
Net sales[a]	$1,526	$ 992	$286
Cost of sales	940	582	199
Depreciation	44	29	17
Partnership income	158	178	52
UCC share of partnership income[b]	85	96	15
Current assets	$ 607	$ 496	$114
Non-current assets	652	698	115
Total assets	$1,259	$1,194	$229
Current liabilities	$ 207	$ 217	$ 16
Non-current liabilities	303	331	52
Total liabilities	$ 510	$ 548	$ 68
Net assets	$ 749	$ 646	$161
UCC equity	$ 368	$ 356	$ 44

a Includes $87 million net sales to UCC and its consolidated subsidiaries in 1989 ($118 million in 1988 and $42 million in 1987).

b UCC share of partnership income has been reported in *Other expenses — net* (see Note 4) and in segment operating profit.

	Corporate Ventures		
Millions of dollars	1989	1988	1987
Net sales*	$1,369	$1,279	$1,226
Cost of sales	889	817	876
Depreciation	74	72	65
Net income	82	83	19
UCC share of net income	38	37	14
Current assets	$ 659	$ 636	$ 698
Non-current assets	854	838	879
Total assets	$1,513	$1,474	$1,577
Current liabilities	$ 477	$ 459	$ 516
Non-current liabilities	331	368	434
Total liabilities	$ 808	$ 827	$ 950
Net assets	$ 705	$ 647	$ 627
UCC equity	$ 359	$ 324	$ 343

*Includes $64 million net sales to UCC and its consolidated subsidiaries in 1989 ($61 million in 1988 and $50 million in 1987).

10. INTERNATIONAL SUBSIDIARIES

The following is a financial summary of consolidated international subsidiaries:

Millions of dollars	1989	1988	1987
Net sales	$2,951	$2,566	$2,136
Net income	$ 132	$ 184	$ 84
UCC share	$ 91	$ 136	$ 48
Total assets	$3,250	$3,086	$3,066
Less: Total liabilities	1,766	1,693	1,683
Net assets	$1,484	$1,393	$1,383
UCC equity	$1,152	$1,083	$1,077

11. LONG-TERM DEBT

Millions of dollars at December 31	1989	1988
DOMESTIC SUBSIDIARY (UCC&P Inc.)		
5.30% Sinking Fund Debentures, with equal annual sinking fund payments to 1997	$ 100	$ 112
7.50% Sinking Fund Debentures due 2006, issued at a discount (effective rate 7.55%) with annual sinking fund payments, 1990 to 2005	174	183
7.50% Convertible Subordinated Debentures due 2012, convertible into common stock at $35.50 per share	345	345
8.50% Sinking Fund Debentures due 2005, with annual sinking fund payments, 1990 to 2004	250	263
8.60% Senior Notes due 1989	—	95
9.10% Senior Notes due 1990	105	105
9.35% Sinking Fund Debentures due 2009, with annual sinking fund payments, 1990 to 2008	200	200
9.35% Senior Notes due 1992	150	150
9.75% Senior Subordinated Notes due 1994	350	350
13.25% Senior Notes due 1993, issued at a discount (effective rate 13.79%)	64	64
14.25% Senior Notes due 1996, issued at a premium (effective rate 13.98%)	19	19
15.00% Senior Debentures due 2006, issued at a premium (effective rate 14.32%)	12	17
Borrowings under major bank credit agreements and money market loans	92	39
Pollution control and other facility obligations	186	178
Obligations under capital leases	35	38
Other debt—various maturities and interest rates	8	18
INTERNATIONAL SUBSIDIARIES		
Canadian Dollar loans and obligations due in varying installments through 1995 with interest at 8.38% to 10.75%	118	160
Canadian Dollar sale and leaseback financing due 2017, subject to redemption at holders' option in September 1992	107	105
Borrowings under major bank credit agreements	23	43
Obligations under capital leases	49	60
Other debt—various maturities and interest rates	73	136
	[illegible],460	2,680
Less: Bonds held for sinking fund	170	193
	2,290	2,487
Less: Payments due within one year	210	192
	$2,080	$2,295

In January 1990, Union Carbide redeemed at par value all $64 million of the 13.25% Senior Notes due 1993.

Union Carbide has major domestic and international bank credit agreements totaling $1,359 million, of which $350 million is committed until December 1990, $130 million is committed until June 1991 with the remainder committed principally until December 1994. At December 31, 1989, Union Carbide had $1,244 million of unused borrowing capability under the agreements. The Corporation has guaranteed UCC&P Inc.'s borrowings under two of these major bank credit agreements.

Under the agreements, options are available to borrow at various rates, on a revolving basis in most cases. The effective interest rate on borrowings under the agreements was approximately 8.9% in 1989 (7.8% in 1988 and 8.0% in 1987).

Certain of these bank credit agreements and the indentures for debt contain various restrictive covenants. These covenants, among other things, restrict the ability of Union Carbide or UCC&P Inc. to merge with another entity, incur or guarantee debt, create liens against assets, sell or transfer certain assets, pay dividends or make other distributions beyond certain limits with respect to UCC&P Inc.'s capital stock, sell shares of a subsidiary's capital stock or issue preferred stock of a subsidiary. Also, certain bank credit agreements require Union Carbide to meet leverage and interest coverage ratios.

Pollution control and other facility obligations represent state, commonwealth and local governmental bond financing of pollution control and other facilities, and are treated for accounting and tax purposes as debt of UCC&P Inc. These tax-exempt obligations mature at various dates from 1990 through 2013, and have an average annual effective interest rate of 7.36%.

At December 31, 1989, $294 million of consolidated assets was pledged as security for $217 million of subsidiaries' debt.

Payments due on long-term debt in the four years after 1990 are: 1991, $34 million; 1992, $190 million; 1993, $142 million; 1994, $394 million.

At December 31, 1989, Union Carbide had outstanding interest rate swap agreements which effectively converted $698 million of fixed rate debt with interest rates ranging from 9.35% to 15% to floating rate debt. Under the agreements, which have a remaining average maturity of approximately two years, Union Carbide makes payments to counterparties at variable rates based on LIBOR and in return receives payments based on fixed interest rates. The agreements resulted in an average annual effective interest rate of approximately 11.41% on the $698 million of debt (11.23% in 1988 on $701 million of debt).

12. UCC STOCKHOLDERS' EQUITY

At December 31, 1989 and 1988, there were 25,000,000 shares of preferred stock ($1 par value) authorized and unissued.

At December 31, 1989, *Retained earnings* included $289 million ($239 million at December 31, 1988), representing the Corporation's share of undistributed earnings of 20% to 50% owned companies accounted for by the equity method. Dividends received from companies carried at equity aggregated $8 million in 1989, $7 million in 1988 and $6 million in 1987.

Certain consolidated domestic and international subsidiaries are restricted by borrowing arrangements, regulatory restraints or the laws of local governments as to their ability to transfer funds to the parent in the form of cash dividends, loans or advances. At December 31, 1989, the amount of such restricted net assets was $308 million. In addition, there are similar restrictions on unconsolidated subsidiaries of $52 million.

Following the exchange effected as of July 1, 1989 (see Note 2), 76,223,798 treasury shares were retired.

On July 26, 1989, the Board of Directors adopted a shareholder rights plan and declared a dividend payable on August 31, 1989, of one Right for each outstanding share of common stock. Each Right entitles its holder, under certain circumstances, to buy a share of common stock at a purchase price of $85 (subject to adjustment). The Rights may not be exercised until 10 days after a person or group acquires 20% or more of Union Carbide Corporation's common stock, or announces a tender offer that if consummated would result in 20% or more ownership of the common stock. Separate Rights certificates will not be issued and the Rights will not be traded separately from the stock until then.

Should an acquirer become the beneficial owner of 20% of the common stock, and under certain additional circumstances, Union Carbide Corporation shareholders (other than the acquirer) would have the right to buy common stock in Union Carbide Corporation, or in the surviving enterprise if the Corporation is acquired, having a value equal to two times the purchase price of the Right then in effect.

The Rights will expire on August 31, 1999, unless redeemed prior to that date. The redemption price is 1 cent per Right. The Corporation's independent directors may redeem the Rights by a majority vote during the ten-day period following public announcement that a person or group has acquired 20% of Union Carbide Corporation's common stock.

13. LEASES

Leases that meet the criteria for capitalization set forth in Statement of Financial Accounting Standards No. 13 have been classified and accounted for as capital leases. For noncapitalized leases, primarily involving distribution equipment and facilities, commitments under noncancelable leases extending for one year or more will require the following future payments:

Millions of dollars					
1990	$116	1993	$ 92	2000-2004	$277
1991	102	1994	73	2005-2009	101
1992	99	1995-1999	319	After 2009	8

Total lease and rental payments under noncapitalized leases extending one month or more were $118 million in 1989 ($111 million in 1988 and $108 million in 1987).

14. RETIREMENT PROGRAMS

The noncontributory defined benefit retirement program of Union Carbide Corporation ("U.S. Retirement Program") covers substantially all U.S. employees and certain employees in other countries. Pension benefits are based primarily on years of service and compensation levels prior to retirement.

Pension coverage for employees of the Corporation's non-U.S. consolidated subsidiaries is provided, to the extent deemed appropriate, through separate plans. Obligations under such plans are systematically provided for by depositing funds with trustees, under insurance policies, or by book reserves.

In 1986, the Corporation adopted SFAS 87 for the U.S. Retirement Program. During 1988, SFAS 87 was adopted for the non-U.S. plans. Prior year pension amounts were not restated for this change. The effect of adopting SFAS 87 for non-U.S. plans was to reduce 1988 net pension cost by $9 million.

U.S. Retirement Program net pension cost amounted to $43 million in 1989, $34 million in 1988 and $28 million in 1987. Net pension cost for non-U.S. plans in 1989 and 1988 amounted to $5 million and $2 million, respectively. Pension costs of non-U.S. plans in 1987 amounted to $14 million.

The components of net pension cost for the U.S. Retirement Program and non-U.S. plans in 1989 and 1988 and for the U.S. Retirement Program in 1987 are as follows:

Millions of dollars	1989		1988		1987	
Service cost—benefits earned during the period		$ 80		$ 72		$ 61
Interest cost on projected benefit obligation		183		170		129
Return on plan assets						
Actual	$(517)		$(225)		$ 20	
Unrecognized return	312	(205)	31	(194)	(175)	(155)
Amortization of net gain		(10)		(12)		(7)
Net pension cost		$ 48		$ 36		$ 28

The funded status of the U.S. Retirement Program and non-U.S. plans was as follows:

Millions of dollars at December 31,	1989	1988
Actuarial present value of plan benefits:		
Accumulated benefit obligation, including vested benefits of $1,871 million at December 31, 1989, and $1,578 million at December 31, 1988	$(1,955)	$(1,636)
Projected benefit obligation	$(2,462)	$(2,100)
Fair value of plan assets, primarily invested in common stocks and fixed income securities	$ 2,543	$ 2,078
Plan assets in excess of (less than) projected benefit obligation	$ 81	$ (22)
Unamortized net asset at transition	(172)	(187)
Unamortized prior service cost	57	52
Unrecognized (gains) and losses—net	(38)	51
Accrued pension cost	$ (72)	$ (106)

The actuarial assumptions used were as follows:

	1989	1988
Discount rate for determining projected benefit obligation	8.0%	9.0%
Rate of increase in compensation levels	6.0%	7.0%
Expected long-term rate of return on plan assets	10.0%	10.0%

Union Carbide Corporation and certain of its consolidated subsidiaries provide health care and life insurance benefits for eligible retired employees. These benefits are provided through various insurance companies and health care providers. The annual insurance premiums, which are based on the benefits paid during the year, are generally expensed as incurred. Total expenses for 1989 amounted to $35 million ($28 million in 1988 and $29 million in 1987). Substantially all of these expenses related to domestic operations.

15. INCENTIVE PLANS

In 1988, stockholders approved the 1988 Union Carbide Long-Term Incentive Plan for key employees, which replaced the 1984 Union Carbide Stock Option Plan. The Plan, effective until January 1, 1994, provides for granting incentive and nonqualified stock options, stock appreciation rights (SAR's), exercise payment rights (EP's), grants of stock and performance awards. Performance awards can be paid in common stock, other securities of the Corporation or in cash. The amount of any exercise payment may not exceed 60% of the amount by which the market price of the common stock on the date of exercise exceeds the option price. On exercise, the SAR's would enable a holder to receive in cash or common stock the amount by which the market price of the common stock on the date of exercise exceeds the option price. Holders of options may be granted the right to receive payments of amounts equal to the regular cash dividends paid to holders of the Corporation's common stock during the period that the option is outstanding. The number of shares granted or subject to options may not exceed 15,000,000 under the Plan. Option prices are 100% of fair market value on the date of the grant. Options, and any related SAR's, generally become exercisable either one year or two years after such date. Options may not have a duration of more than 10 years.

No further awards can be made under Union Carbide's previous incentive plans. Options granted under these plans have terms similar to non-qualified stock options granted under the 1988 plan.

For SAR's and EP's granted, income is adjusted in each quarter to reflect the market price of the common stock.

Changes during 1989 in outstanding shares under options, SAR's and EP's were as follows:

	Shares under Option			
1989	Total	With SAR's Only	With EP's Only	Options Only
Outstanding at January 1	6,129,043	1,144,190	49,756	4,935,097
Granted during the year under the 1988 Union Carbide Long-Term Incentive Plan	1,728,800	284,500	—	1,444,300
Exercised during the year	1,047,121[a]	108,790	14,100	924,231
Canceled or expired during the year	10,900	—	—	10,900
Outstanding at December 31	6,799,822[b]	1,319,900	35,656	5,444,266

a Options were exercised during 1989 at prices ranging from $1.22 to $27.75 per share. Of these, 938,331 were exercised for shares of common stock.

b For outstanding shares under option at December 31, 1989, option prices ranged from $1.22 to $27.75 per share. At December 31, 1989, 4,826,822 shares were exercisable at prices ranging from $1.22 to $27.75 per share.

16. COMMITMENTS AND CONTINGENCIES

At December 31, 1989, the Corporation and its consolidated subsidiaries had contingent obligations of $472 million, principally for purchase and sale commitments related to the ordinary conduct of business and guarantees of outstanding loans and notes payable by others. It is not expected that these contingent obligations will have a material adverse effect on the consolidated financial position of the Corporation.

On February 24, 1989, UCC&P Inc., formerly Union Carbide Corporation, and Union Carbide India Limited ("UCIL") paid the final settlement of all litigation with respect to the December 3, 1984 methyl isocyanate gas release at the UCIL plant in Bhopal, India. The $470 million settlement was ordered by the Supreme Court of India and accepted by the Union of India, UCC&P Inc. and UCIL. UCC&P Inc. is a 50.9% shareholder of UCIL. UCC&P Inc. paid $420 million and was credited an additional $5 million for the payment in that amount made by it to the Red Cross at the suggestion of U.S. Judge John F. Keenan. UCIL paid the Rupee equivalent of $45 million. The Supreme Court of India discharged the previous undertaking of UCC&P Inc. in the District Court at Bhopal to maintain unencumbered assets having a fair market value of $3 billion. The Supreme Court quashed all criminal proceedings related to the gas release, and the Supreme Court proceedings provide that the accused are deemed acquitted. On December 22, 1989, the Supreme Court of India upheld the Bhopal Act under the Indian Constitution. The Bhopal Act was the main basis upon which the Union of India represented the victims. Various applications remain pending in the Supreme Court of India to set aside the settlement. On January 12, 1990, the new administration of the Government of India announced that it would support these applications. The Corporation and its legal counsel in the United States and India believe that this settlement is final and that no basis exists to set it aside. All of the suits that were brought in the United States with respect to the gas release have been dismissed, except one suit in a state court. The settlement will be placed before that court.

In addition to the above, the Corporation and its consolidated subsidiaries are involved in a number of legal proceedings and claims with both private and governmental parties. These cover a wide range of matters including, but not limited to: trade regulation; product liability; utility regulation; Federal regulatory proceedings; health, safety, and environmental matters; patents and trademarks; contracts; taxes; and stockholder and debenture holder claims. In some of these cases, the remedies that may be sought or damages claimed are substantial.

While it is impossible at this time to determine with certainty the ultimate outcome of any of the litigation referred to in this note, management believes that adequate provisions have been made for probable losses with respect thereto and that such ultimate outcome, after provisions therefor, will not have a material adverse effect on the consolidated financial position of the Corporation. Should any losses be sustained in connection with any of the matters referred to in this note, in excess of provisions therefor, they will be charged to income in the future.

Union Carbide's financial statements are prepared by management, which is responsible for their fairness, integrity and objectivity. The accompanying financial statements have been prepared in conformity with generally accepted accounting principles applied on a consistent basis and, accordingly, include amounts that are estimates and judgments. All historical financial information in this annual report is consistent with the accompanying financial statements.

Union Carbide maintains accounting systems, including internal accounting controls monitored by a staff of internal auditors, that are designed to provide reasonable assurance of the reliability of financial records and the protection of assets. The concept of reasonable assurance is based on recognition that the cost of a system must not exceed the related benefits. The effectiveness of those systems depends primarily upon the careful selection of financial and other managers, clear delegation of authority and assignment of accountability, inculcation of high business ethics and conflict-of-interest standards, policies and procedures for coordinating the management of corporate resources and the leadership and commitment of top management.

Union Carbide's financial statements are audited by KPMG Peat Marwick, independent certified public accountants, in accordance with generally accepted auditing standards. These standards provide for a review of internal accounting control systems and tests of transactions to the extent they deem appropriate.

The Audit Committee of the Board of Directors, which consists solely of non-employee directors, is responsible for overseeing the functioning of the accounting system and related controls and the preparation of annual financial statements. The Audit Committee recommends to the Board of Directors the selection of the independent auditors, subject to the approval of shareholders. The Audit Committee periodically meets with the independent auditors, management and internal auditors to review and evaluate their accounting, auditing and financial reporting activities and responsibilities. The independent and internal auditors have full and free access to the Audit Committee and meet with the committee, with and without management present.

John K. Wulff
Vice President, Controller and
Principal Accounting Officer

Robert D. Kennedy
Chairman, President and
Chief Executive Officer

Danbury, Connecticut
February 26, 1990

INDEPENDENT AUDITORS' REPORT

KPMG Peat Marwick

To the Stockholders and Board of Directors of
Union Carbide Corporation

We have audited the accompanying consolidated balance sheet of Union Carbide Corporation and subsidiaries as of December 31, 1989 and 1988, and the related consolidated statements of income, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 1989. These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated 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 consolidated financial statements referred to above present fairly, in all material respects, the financial position of Union Carbide Corporation and subsidiaries at December 31, 1989 and 1988, and the results of their operations and their cash flows for each of the years in the three-year period ended December 31, 1989, in conformity with generally accepted accounting principles.

KPMG Peat Marwick

Stamford, Connecticut
February 26, 1990

DEFINITION OF TERMS

Unless the context otherwise requires, the terms below refer to the following:

Union Carbide, UCC Consolidated, we, our	Union Carbide Corporation and its consolidated subsidiaries
Corporation, UCC	Union Carbide Corporation, the parent company
domestic	United States and Puerto Rico
domestic operations	Operations of Union Carbide in this area, including exports
international operations	Operations of Union Carbide in areas of the world other than the United States and Puerto Rico
Union Carbide Chemicals and Plastics, Chemicals & Plastics, UCC&P	Worldwide chemicals and plastics business of Union Carbide
Union Carbide Industrial Gases, Industrial Gases, UCIG	Worldwide industrial gases and coatings service business of Union Carbide
UCAR Carbon, Carbon Products	Worldwide carbon products business of Union Carbide

The use of these terms is for convenience of reference only. The consolidated subsidiaries are separate legal entities which are managed by, and accountable to, their respective Boards of Directors.

DIRECTORS

John J. Creedon[1,3,4,6]
Director and Chairman of the Executive Committee of Metropolitan Life Insurance Company

C. Fred Fetterolf[1,2,5]
Director, President and Chief Operating Officer of Aluminum Company of America (ALCOA)

Harry J. Gray[2,3,4]
Chairman and Chief Executive Officer of American Medical International Inc.

James M. Hester[1,3,6,7]
President, The Harry Frank Guggenheim Foundation

Vernon E. Jordan, Jr.[2,6,7]
Partner, Akin, Gump, Strauss, Hauer and Feld

Robert D. Kennedy[3]
Chairman, President and Chief Executive Officer of Union Carbide Corporation

Ronald L. Kuehn, Jr.[2,5,7]
Director, Chairman, President and Chief Executive Officer of Sonat Inc.

C. Peter McColough[2,3,5,7]
Director and Retired Chairman of Xerox Corporation

Rozanne L. Ridgway[6,7]
President, Atlantic Council of the United States

Alice M. Rivlin[4,5,6,7]
Senior Fellow, Economic Studies Program, Brookings Institution

William S. Sneath[1,3,4,5]
Director of various corporations; Retired Chairman and Chief Executive Officer of Union Carbide Corporation

J. Clayton Stephenson[3,4]
Retired Vice Chairman of Union Carbide Corporation

Russell E. Train[1,5,6,7]
Chairman of World Wildlife Fund and The Conservation Foundation

J. Clayton Stephenson will not stand for reelection. He will be greatly missed.

We are pleased to welcome Ambassador Rozanne L. Ridgway, president of the Atlantic Council of the United States, who was elected to the Board on October 25, 1989, effective January 1, 1990.

NOTES

1 Member of Audit Committee (Chairman: John J. Creedon)
2 Member of Compensation & Management Development Committee (Chairman: Ronald L. Kuehn, Jr.)
3 Member of Executive Committee (Chairman: Robert D. Kennedy)
4 Member of Finance & Pension Committee (Chairman: Harry J. Gray)
5 Member of Health, Safety & Environmental Affairs Committee (Chairman: Russell E. Train)
6 Member of Nominating Committee (Chairman: Vernon E. Jordan, Jr.)
7 Member of Public Policy Committee (Chairman: James M. Hester)

OFFICERS

ROBERT D. KENNEDY
Chairman, President and Chief Executive Officer of Union Carbide Corporation

H. WILLIAM LICHTENBERGER
Vice President, President of Union Carbide Chemicals and Plastics Company Inc.

JOHN R. MacLEAN
Vice President, President of Union Carbide Industrial Gases Inc.

ROBERT P. KRASS
Vice President, President of UCAR Carbon Company Inc.

JOHN A. CLERICO
Vice President, Treasurer and Principal Financial Officer

JOSEPH E. GEOGHAN
Vice President and General Counsel

GILBERT E. PLAYFORD
Vice President, Strategic Planning

O. JULES ROMARY
Vice President and Secretary

CORNELIUS C. SMITH, JR.
Vice President, Community & Employee Health, Safety & Environmental Affairs

ROBERT V. WELTY
Vice President, Human Resources

RONALD S. WISHART
Vice President, Public Affairs

JOHN K. WULFF
Vice President, Controller and Principal Accounting Officer

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1990 ANNUAL MEETING

The 1990 annual meeting of stockholders will be held on Wednesday, April 25, in the Grand Ballroom of the Danbury Hilton, 18 Old Ridgebury Road, Danbury, Conn. 06810 beginning at 10 a.m.

A notice of annual meeting and proxy statement, and a proxy voting card, are mailed to each stockholder in March, together with a copy of the current annual report.

A report on the annual meeting, including a summary of proceedings and the results of voting on items of business, appears in the June quarterly report to shareholders.

GENERAL OFFICES

The general offices of Union Carbide Corporation are located at 39 Old Ridgebury Road, Danbury, Conn. 06817-0001 (Tel. 203-794-2000).

Inquiries from the public about Union Carbide and its products and services should be directed to the Corporate Information Center, Union Carbide Corporation, Section N-2, 39 Old Ridgebury Road, Danbury, Conn. 06817-0001 (Tel. 203-794-5300).

STOCK EXCHANGES

Union Carbide stock is traded primarily on the New York Stock Exchange (Ticker Symbol: UK). The stock is also listed on the Midwest Stock Exchange and on the Pacific Stock Exchange in the United States, and overseas on the exchanges in Amsterdam, Basel, Brussels, Frankfurt, Geneva, Lausanne, London, Paris and Zurich.

STOCK RECORDS AND TRANSFER

The Corporation acts as its own stock transfer agent through Shareholder Services, Union Carbide Corporation, Section G-2, 39 Old Ridgebury Road, Danbury, Conn. 06817-0001 (Tel. 203-794-3350).

Shareholder Services maintains stockholder records, transfers stock and can answer questions regarding stockholders' accounts, including dividend reinvestment accounts. Stockholders wishing to transfer stock to someone else or to change the name on a stock certificate should contact Shareholder Services for assistance.

The Registrar is Manufacturers Hanover Trust Company of New York, N.Y.

DIVIDEND REINVESTMENT

Stockholders may purchase shares directly from the company through Union Carbide's Dividend Reinvestment and Stock Purchase Plan. Under the plan, shares can be purchased from the company free of commissions and service charges.

A prospectus explaining the plan in detail may be obtained from Shareholder Services, Union Carbide Corporation, Section G-2, 39 Old Ridgebury Road, Danbury, Conn. 06817-0001 (Tel. 203-794-2212).

STOCKHOLDER INQUIRIES

Inquiries about stockholder accounts and dividend reinvestment should be directed to Shareholder Services, Union Carbide Corporation, Section G-2, 39 Old Ridgebury Road, Danbury, Conn. 06817-0001.

Inquiries from investors and investment-related questions about Union Carbide should be directed to the Investor Relations Department, Union Carbide Corporation, Section D-4, 39 Old Ridgebury Road, Danbury, Conn. 06817-0001 (Tel. 203-794-6440).

Investor Insight, a package of financial material that recapitulates quarterly results, is available upon written request to Investor Relations at the address above.

FORM 10-K AVAILABLE

A Form 10-K Report for the year ended December 31, 1989, will be available in April of 1990. A copy may be obtained without charge upon written request to the Secretary of Union Carbide Corporation, Section E-4, 39 Old Ridgebury Road, Danbury, Conn. 06817-0001.

Union Carbide annually publishes a list of organizations receiving charitable, educational, cultural or similar grants of $5,000 or more. This list is available to any stockholder upon written request to the Secretary at the address above.

UNION CARBIDE CORPORATION
39 OLD RIDGEBURY ROAD
DANBURY, CT 06817-0001

030-17840
37-19533-01

UNION CARBIDE

BUSHY RUN RESEARCH CENTER

6702 Mellon Road, Export, Pennsylvania 15632-8902

Telephone (412) 733-5200
Telecopier (412) 733-4804

September 27, 1990

United States Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

RECEIVED
'90 NOV -5 P1:39
U.S. N.R.C. FEE MGMT BRANCH

Dear Mr. Reber:

As per my letter dated August 29, 1990 (copy enclosed), the deadline cannot be met. Our corporate office at Danbury, CT has informed me that the information will be available in approximately two weeks. I apologize for any inconvenience this may cause. If you should have further questions please call me at (412) 733-5245.

Sincerely,

Marilyn J. Tallant

Marilyn J. Tallant
Radiation Safety Officer

MJT/kam

Enclosure

Log Nov. 2
Remitter
Check No.
Amount
Fee Category 3M
Type of Fee AMD
Date Check Rec'd.
Date Completed
By:

FEE NOT REQUIRED

OFFICIAL RECORD COPY ML18

113570

OCT 01 1990

(FOR LFMS USE)
INFORMATION FROM LTS

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

PROGRAM CODE: 03620
STATUS CODE: 0
FEE CATEGORY: 3M
EXP. DATE: 19911231
FEE COMMENTS: ____________________

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
   APPLICANT/LICENSEE: UNION CARBIDE CORP.
   RECEIVED DATE: 901001
   DOCKET NO: 3017840
   CONTROL NO.: 113570
   LICENSE NO.: 37-19533-01
   ACTION TYPE: AMENDMENT

2. FEE ATTACHED
   AMOUNT: ---/-----
   CHECK NO.: ---/-----

3. COMMENTS

SIGNED Tysha M Harkamp
DATE 10/30/90

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /✓/)

1. FEE CATEGORY AND AMOUNT: 3M FEE NOT REQUIRED

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR: per 8/30/90 Memo
   AMENDMENT ____________
   RENEWAL ____________
   LICENSE ____________

3. OTHER ______________________________
   ____

SIGNED sh
DATE 1/15/91