

IN THE MATTER OF
OLIN CORPORATION

FINAL ORDER, OPINION, ETC., IN REGARD TO ALLEGED VIOLATION OF
SEC. 7 OF THE CLAYTON ACT AND SEC. 5 OF THE
FEDERAL TRADE COMMISSION ACT

Docket 9196. Complaint, July 18, 1985—Final Order, June 13, 1990

This final order requires the respondent, a Stamford, Ct., based corporation, to divest the swimming pool chemicals business it acquired from FMC Corporation to a Commission-approved acquirer within twelve months, or else have the Commission appoint a trustee to effect the divestiture. In addition, for ten years, respondent must obtain FTC approval before acquiring any interest in a company that produces and sells swimming pool chemicals.

Appearances

For the Commission: *Stephen W. Riddell* and *John V. Lacci*.

For the respondent: *Stuart N. Roth*, *Olin Corporation*, Stamford, Ct. *Brian C. Mohr*, *Skadden, Arps, Slate, Meagher & Flom*, Washington, D.C. *Jim Lynch*, *Morgan, Lewis & Bockius*, Washington, D.C. and *Neal R. Stoll*, *Skadden, Arps, Slate, Meagher & Flom*, New York, N.Y.

COMPLAINT

The Federal Trade Commission, having reason to believe that respondent, Olin Corporation ("Olin"), a corporation subject to the jurisdiction of the Commission, has entered into an agreement with FMC Corporation ("FMC"), which agreement, if consummated, would violate Section 7 of the Clayton Act, as amended, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45, that said agreement constitutes a violation of Section 5 of the Federal Trade Commission Act, as amended, and that a proceeding in respect thereof would be in the public interest, hereby issues its complaint, stating its charges as follows:

I. DEFINITIONS

1. For the purposes of this complaint, the following definitions shall apply:

(a) "*Dry swimming pool sanitizers*" means dry chemical compounds, generally containing chlorine as the sanitizing or disinfecting agent, that are used to kill bacteria and inhibit the growth of algae in swimming pool water, including, but not limited to, chlorinated isocyanurates and calcium hypochlorite;

(b) "*Chlorinated isocyanurates*" means cyanuric acid's chlorinated derivatives, dichloroisocyanurates and trichloroisocyanuric acid, which, among other applications, are used as dry swimming pool sanitizers; and

(c) "*Calcium hypochlorite*" means a white crystalline solid produced from hydrated lime, chlorine and alkali, which is used primarily as a dry swimming pool sanitizer.

II. OLIN

2. Olin is a corporation organized under the laws of Virginia with its executive offices at 120 Long Ridge Road, Stamford, Connecticut.

3. Olin is a major worldwide manufacturer of chemicals, metal products and ammunition.

4. In 1984, Olin had sales of \$2.1 billion and assets of \$1.6 billion.
[2]

5. Olin is a leading marketer of chlorinated isocyanurates in the United States and throughout the world, and has a major facility for the production of trichloroisocyanuric acid located at Lake Charles, Louisiana, which facility is not presently producing any trichloroisocyanuric acid.

6. Olin is the world's leading manufacturer and marketer of calcium hypochlorite, and operates a major facility for the production of calcium hypochlorite at Charleston, Tennessee.

III. FMC

7. FMC is a corporation organized under the laws of Delaware with its executive offices at 200 East Randolph Drive, Chicago, Illinois.

8. FMC is among the world's largest producers of machinery and chemicals for industrial, agricultural and governmental use.

9. In 1984, FMC has sales of approximately \$3.3 billion and assets of approximately \$2.4 billion.

10. FMC is a leading manufacturer and marketer of chlorinated isocyanurates, and operates a major facility for the production of chlorinated isocyanurates at South Charleston, West Virginia.

IV. JURISDICTION

11. At all times relevant herein, respondent, Olin, has been, and is now, engaged in commerce as "commerce" is defined in Section 1 of the Clayton Act, as amended, 15 U.S.C. 12, and is a corporation whose business is in or affecting commerce as "commerce" is defined in Section 4 of the Federal Trade Commission Act, as amended, 15 U.S.C. 44.

V. THE ACQUISITION

12. On or about February 7, 1985, Olin and FMC entered into an agreement pursuant to which Olin intends to acquire FMC's chlorinated isocyanurate and cyanuric acid assets for \$49.5 million. Among the assets included in the agreement are FMC's chlorinated isocyanurate and cyanuric acid plant at South Charleston, West Virginia; FMC's repackaging facility at Livonia, Michigan; FMC's Sun brand name; FMC's technology for the production of cyanuric acid and chlorinated isocyanurates; and FMC's fifty percent (50%) interest in Chlor-Chem, Limited, a European manufacturer of chlorinated isocyanurates.

VI. TRADE AND COMMERCE

13. The relevant product markets in which to evaluate the effects of this acquisition are:

- (a) The manufacture and sale of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers; and
- (b) The manufacture and sale of chlorinated isocyanurate dry swimming pool sanitizers. [3]

14. The relevant geographic market is the United States.

A. *Chlorinated Isocyanurate and Calcium Hypochlorite Dry Swimming Pool Sanitizer Market*

15. The total value, at the producer level, of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers produced for consumption in the United States in 1984 was approximately \$320 million. In 1984, manufacturing facilities located in the United States had the capacity to produce approximately 350 million pounds of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers annually.

16. The value of Olin's production of chlorinated isocyanurates and calcium hypochlorite accounted for 40.6% of the value (stated in

paragraph 15 hereof) of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers produced for consumption in the United States in 1984.

17. The value of FMC's production of chlorinated isocyanurates accounted for 16.3% of the value (stated in paragraph 15 hereof) of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers produced for consumption in the United States in 1984.

18. Olin, including its Lake Charles, Louisiana trichloroisocyanuric acid plant, presently accounts for approximately 50% of the United States capacity (stated in paragraph 15 hereof) for the production of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers.

19. FMC presently accounts for approximately 12% of the United States capacity (stated in paragraph 15 hereof) for the production of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers.

20. Barriers to entry into the manufacture of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers are substantial.

21. Olin and FMC are actual, direct and substantial competitors in the manufacture and sale of chlorinated isocyanurates and calcium hypochlorite dry swimming pool sanitizers in the United States, and throughout the world.

*B. Chlorinated Isocyanurate Dry Swimming
Pool Sanitizer Market*

22. The total value, at the producer level, of chlorinated isocyanurate dry swimming pool sanitizers produced for consumption in the United States in 1984 was approximately \$121 million. In 1984, manufacturing facilities located in the United States had the capacity to produce approximately 162 million pounds of chlorinated isocyanurate dry swimming pool sanitizers annually.

23. In 1983 Olin produced 15.5 million pounds of chlorinated isocyanurates. In 1984 Olin produced 14.3 million pounds of chlorinated isocyanurates before entering an agreement to obtain chlorinated isocyanurates from another chlorinated isocyanurate producer and closing its own production facility. The chlorinated isocyanurates produced by and purchased for resale by Olin accounted for approximately 16% of the chlorinated isocyanurate dry swimming pool sanitizers produced for consumption in the United States in 1984. [4]

24. FMC's production of chlorinated isocyanurates accounted for 29.6% of the chlorinated isocyanurate dry swimming pool sanitizers produced for consumption in the United States in 1984.

25. Olin, including its Lake Charles, Louisiana trichloroisocyanuric acid plant, presently accounts for approximately 19.2% of the United States capacity (stated in paragraph 22 hereof) for the production of chlorinated isocyanurate dry swimming pool sanitizers.

26. FMC presently accounts for approximately 26.6% of the United States capacity (stated in paragraph 22 hereof) for the production of chlorinated isocyanurate dry swimming pool sanitizers.

27. Barriers to entry into the manufacture of chlorinated isocyanurate dry swimming pool sanitizers are substantial.

28. Olin and FMC are actual, direct and substantial competitors in the manufacture and/or sale of chlorinated isocyanurate dry swimming pool sanitizers in the United States, and throughout the world.

VII. EFFECTS OF THE ACQUISITION

29. The effects of the proposed acquisition of FMC's isocyanurate assets by Olin may be substantially to lessen competition or to tend to create a monopoly in the relevant markets in violation of Section 7 of the Clayton Act, as amended, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45, because, *inter alia*:

(a) Substantial direct competition between Olin and FMC in the relevant lines of commerce will be eliminated;

(b) Already high concentration in the relevant lines of commerce will be increased, thereby increasing the likelihood of successful collusive behavior among the remaining firms in the relevant lines of commerce; and

(c) FMC will be eliminated as a significant independent competitive influence in the relevant lines of commerce.

VIII. VIOLATIONS CHARGED

30. The proposed acquisition of the chlorinated isocyanurate and cyanuric acid assets of FMC by Olin would, if consummated, violate Section 7 of the Clayton Act, as amended, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45.

31. The purchase agreement described in paragraph 12 violates Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45.

AGREEMENT TO MAINTAIN ISOCYANURATE ASSETS
AND TO TERMINATE THE MONSANTO TOLLING AGREEMENT

Agreement, dated as of July 18, 1985, by and between Olin Corporation ("Olin"), a corporation organized and existing under and by virtue of the laws of the Commonwealth of Virginia with headquarters at 120 Long Ridge Road, Stamford, Connecticut, and the Federal Trade Commission ("Commission"), an independent agency of the United States Government established under the Federal Trade Commission Act of 1914 (Olin and the Commission are collectively, the "Parties").

On or about March 7, 1985, the Bureau of Competition of the Federal Trade Commission commenced an investigation of Olin's proposed acquisition ("Asset Acquisition") of certain assets ("Isocyanurate Assets") of FMC Corporation ("FMC") pursuant to an asset purchase agreement ("Asset Purchase Agreement").

During the course of this investigation, it has come to the attention of the Commission that in 1984 Olin entered into an agreement with Monsanto Company ("Monsanto") under which Monsanto provides Olin with chlorinated isocyanurates for resale ("Monsanto Tolling Agreement"). The Commission has raised questions concerning the competitive implications of the Monsanto Tolling Agreement in the context of the proposed Asset Acquisition.

Olin and FMC wish to avoid any delay which might result from an action brought by the Commission to enjoin Olin and FMC from consummating the Asset Acquisition. [2]

The Commission, subject to all of the terms and conditions stated herein, agrees to refrain from commencing an action to enjoin the consummation of the Asset Acquisition. The Commission, however, is concerned that Olin maintain the Isocyanurate Assets in a state equal to, or better than, their Current Condition pending further investigation of the Asset Acquisition and the Commission's consideration of any appropriate ultimate relief, which relief may include, without limitation, an order requiring Olin to divest all or part of the Isocyanurate Assets. To mitigate this concern, Olin agrees to maintain the acquired Isocyanurate Assets in a state equal to, or better than, their Current Condition. Also, in order to respond to the questions raised concerning the competitive implications of the Monsanto Tolling Agreement during the pendency of this investigation or any administrative proceeding challenging the Asset Acquisition, Olin

agrees, subject to the provisions of paragraph 5 hereof, to withdraw from that agreement in conjunction with the consummation of the Asset Acquisition.

Wherefore, in consideration of the mutual covenants set forth herein, the Parties agree as follows:

1. Definitions.

As used in this Agreement, the following terms shall have the following meanings:

(a) "*Olin*" means Olin Corporation, its successors and assigns, and all of its divisions and majority-owned subsidiaries, wherever located;

(b) "*FMC*" means FMC Corporation, a corporation organized and existing under the laws of the State of Delaware, its successors and assigns, and all of its subsidiaries, affiliates, divisions, joint ventures and partnerships, whether wholly or partly owned, and wherever located; [3]

(c) "*Agreement*" means this Agreement to Maintain Isocyanurate Assets and to Terminate the Monsanto Tolling Agreement;

(d) "*Isocyanurate Assets*" means the tangible and intangible assets of the isocyanurate business of FMC, and includes, without limitation, the South Charleston Isocyanurate Plant, the Livonia Repackaging Operations, the Sun brand name, any other brand names used to identify products manufactured or sold by the isocyanurate business of FMC, all technology, including the Sulfolane technology, used or intended to be used in the production of cyanuric acid and/or chlorinated isocyanurates, and the fifty percent (50%) interest currently held by FMC in Chlor-Chem, Limited ("Chlor-Chem"), together with all associated titles, properties, interests, rights and privileges, including without limitation, all buildings, machinery, equipment, Sun brand and bulk isocyanurate customer lists, patents, trade names, trademarks, and other property of whatever description, together with all additions and improvements thereto, whether made before or after the Asset Acquisition;

(e) "*Asset Acquisition*" means Olin's acquisition of the Isocyanurate Assets from FMC pursuant to the Asset Purchase Agreement;

(f) "*Asset Purchase Agreement*" means the agreement or agreements between Olin and FMC pursuant to which [4] Olin is to acquire, and does acquire, all or any part of the Isocyanurate Assets of FMC. The Asset Purchase Agreement includes, without limitation, the agreement set forth in the letter (attached as Exhibit A), dated

February 7, 1985, as subsequently modified by the parties in reaching a definitive agreement pursuant to which all or any part of the Isocyanurate Assets are transferred from FMC to Olin;

(g) "*Current Condition*" means the Production Capabilities and integrity of the Isocyanurate Assets at the time of the closing of the Asset Acquisition. For purposes of this definition, the "*Production Capabilities*" of the South Charleston Isocyanurate Plant means:

- (i) [] pounds annually for the Cyanuric Acid Line at the same or equivalent consumption rates of principal raw material inputs, including energy, achieved on this line at this volume in 1984.
- (ii) [] pounds annually for the Trichlor Line at the same or equivalent consumption rates of principal raw material inputs, including energy, achieved on this line at this volume in 1984.
- (iii) [] pounds annually for the Dichlor Line at the same or equivalent [5] consumption rates of principal raw material inputs, including energy, achieved on this line at this volume in 1984.
- (iv) [] pounds annually of Trichlor or [] pounds annually of Dichlor for the Swing Line at the same or equivalent consumption rates of principal raw material inputs, including energy, achieved on this line at this volume in 1984.

For purposes of this definition, the "*Production Capabilities*" of the Livonia Repackaging Operations means [] pounds of Trichlor packaged per month per shift and [] pounds of Dichlor packaged per month per shift.

Nothing in this Agreement shall prohibit Olin from improving the Production Capabilities of the South Charleston Isocyanurate Plant and/or the Livonia Repackaging Operations.

(h) "*South Charleston Isocyanurate Plant*" means the chlorinated dry bleach manufacturing facilities located at South Charleston, West Virginia, and includes, without limitation, the facilities and equipment for the manufacture, processing, storage and preparation for bulk shipment of trichlor, dichlor and cyanuric acid;

(i) "*Livonia Repackaging Operations*" means the [6] repackaging facility and swimming pool chemicals support operations to be acquired by Olin from FMC pursuant to the Asset Purchase

Agreement, including, without limitation, the assets and operations of Sun Pool Products and the repackaging facilities located in Livonia, Michigan, but excluding any sodium hypochlorite equipment or facilities so acquired;

(j) "*Trichlor*" means trichloroisocyanuric acid;

(k) "*Dichlor*" means any sodium dichloroisocyanurate;

(l) "*Cyanuric Acid Line*" means the set of equipment at the South Charleston Isocyanurate Plant historically used in, and dedicated to, the manufacture, processing, storage, packaging and preparation for bulk shipment of cyanuric acid;

(m) "*Trichlor Line*" means the set of equipment at the South Charleston Isocyanurate Plant historically used in, and dedicated to, the manufacture, processing, storage, packaging and preparation for bulk shipment of trichlor;

(n) "*Dichlor Line*" means the set of equipment at the South Charleston Isocyanurate Plant historically used in, and dedicated to, the manufacture, processing, storage, packaging and preparation for bulk shipment of dichlor;

(o) "*Swing Line*" means the set of equipment at the South Charleston Isocyanurate Plant historically used in the manufacture, processing, storage, packaging and preparation for bulk shipment of both trichlor and dichlor; [7]

(p) "*Material Confidential Information*" means competitively sensitive or proprietary information not independently known to Olin and includes, but is not limited to, supplier lists, Sun brand and bulk isocyanurate customer lists, present and forecasted production rates, price and cost information, patents, technologies, processes, trade secrets and other knowhow;

(q) "*Competitive Plant Operating Practice*" means the management and operation of the South Charleston Isocyanurate Plant and the Livonia Repackaging Operations in such a manner as to maintain, or improve their Current Condition, including, without limitation, the requirements that capital investment be made sufficient to maintain their Current Condition, that all improvements be made which are necessary to maintain their Current Condition, and that these facilities be maintained in accordance with Olin's usual standards of plant maintenance or with accepted industry practice, whichever standard is higher;

(r) "*Monsanto Tolling Agreement*" means the agreement (attached as Exhibit B), effective July 1, 1984, between Olin and Monsanto

Company relating to the tolling and sale of cyanuric acid, trichlor and dichlor, and any and all modifications thereto. [8]

2. Purpose

This Agreement is entered into for the purposes of allowing Olin to consummate the Asset Acquisition and to avoid litigating an action brought by the Commission to enjoin Olin from consummating the Asset Acquisition; of assuring that the Isocyanurate Assets will remain in a state equal to, or better than, their Current Condition; of allowing the Commission the opportunity to complete its investigation and deliberations while preserving the Commission's ability to obtain effective divestiture or other appropriate relief; and of terminating the Monsanto Tolling Agreement in a manner that will minimize any anticompetitive implications of that agreement in the context of the consummation of the Asset Acquisition. All questions arising under this Agreement are to be resolved in furtherance of these stated purposes.

3. Term of the Agreement

This Agreement shall remain in effect and be binding upon the Parties, their successors and assigns, until October 1, 1985; provided, however, that this Agreement shall terminate immediately upon receipt of notice by Olin from the Commission or any authorized representative thereof that the investigation has been closed; provided further, however, that notwithstanding any other provision of this paragraph, if the Commission, prior to the above-mentioned date, issues an administrative complaint challenging the Asset Acquisition, this Agreement shall remain in effect until the administrative complaint is dismissed by the Commission, or until the appellate review process is exhausted, or until the order of the Commission made thereon becomes final.

4. Maintenance of Current Condition of Isocyanurate Assets

Olin agrees that during the term of this Agreement it shall take all necessary steps to maintain the acquired Isocyanurate Assets in a state equal to, or better than, [9] their Current Condition, and that Olin shall not knowingly cause, or fail to take reasonable steps to prevent, any diminution of the Current Condition of said Isocyanurate Assets, except that Olin shall not be responsible for any diminution of the Current Condition of the Isocyanurate Assets which is the

proximate result of any circumstance beyond Olin's control such as an act of God, fire, flood, war, government action, or labor trouble. Without in any way limiting the foregoing:

(a) *Maintenance of South Charleston Isocyanurate Plant*

Olin agrees that it shall take all necessary steps to maintain the Current Condition of the South Charleston Isocyanurate Plant, and that Olin shall not knowingly cause, or fail to take reasonable steps to prevent, any change in the South Charleston Isocyanurate Plant or its manner of operation that would impair its Current Condition as an isocyanurate plant. Olin agrees to staff and manage this facility consistent with Competitive Plant Operating Practice, and to maintain all the equipment in the facility in good working order. In addition, Olin agrees not to make any permanent changes in the Swing Line that would preclude that line from being able to produce either dichlor or trichlor in the future, and will maintain the Swing Line in such a manner that, upon divestiture, this Line would be capable of producing either trichlor or dichlor. Provided, however, that if Olin determines not to operate all, or any part of, the South Charleston Isocyanurate Plant's Cyanuric Acid Line, Trichlor Line, Dichlor Line or Swing Line, Olin shall maintain said Line or Lines in such a condition that, at any given time, cyanuric acid, trichlor and dichlor production could be recommenced on said Cyanuric Acid, Trichlor, Dichlor, and Swing Lines, respectively, within 12 (twelve) months, and could be recommenced in a state equal to, or better than, the Current Condition. Moreover, in order to facilitate possible future divestiture of these assets, Olin agrees, at the time the Commission issues a divestiture order, to begin the steps necessary to restore the Current Condition of the Cyanuric Acid, Trichlor, Dichlor, or Swing Lines, or any part or parts thereof, that were not operated by Olin during the course of this Agreement. Olin [10] agrees that, within 12 (twelve) months of the time the Commission issues a divestiture order, these assets will have been restored to their Current Condition so that they could be immediately utilized by any purchaser of the divested assets as isocyanurate production lines.

(b) *The Livonia Repackaging Operations*

Olin agrees that, with the exception of the sodium hypochlorite assets located there, it shall take all necessary steps to maintain the Current Condition of the Livonia Repackaging Operations and that

Olin shall not knowingly cause, or fail to take reasonable steps to prevent, any change in the Livonia Repackaging Operations or its manner of operation that would impair its Current Condition as a repackaging and swimming pool chemicals support operation.

(c) *Maintenance of the Sun Brand*

Olin agrees to preserve the independence of the Sun brand, to use its best efforts to restore or improve upon the sales volumes achieved by the Sun brand in 1984, and not to knowingly cause the diminution of the brand.

5. Withdrawal From The Monsanto Tolling Agreement

Olin agrees to withdraw from the Monsanto Tolling Agreement in accordance with the following provisions:

(a) Olin shall take all necessary steps to terminate, and shall terminate, the Monsanto Tolling Agreement as of December 31, 1986, and, within seven business days of the execution of this Agreement, shall notify Monsanto of its intention to terminate the Monsanto Tolling Agreement; [11]

(b) Olin will order a maximum of [] pounds of trichlor and [] pounds of dichlor from Monsanto for delivery between the date of this Agreement and December 31, 1985;

(c) Olin will order a maximum of [] pounds of trichlor and [] pounds of dichlor from Monsanto for delivery between December 31, 1985, and June 30, 1986; and

(d) Olin will accept no trichlor, dichlor or cyanuric acid from Monsanto under the Monsanto Tolling Agreement after the above orders are received.

6. Maintenance of Books and Records

Olin shall maintain separate cost books and records for the South Charleston Isocyanurate Plant and the Livonia Repackaging Operations. Olin shall prepare, in a manner consistent with its standard reporting procedures, a separate financial statement for the Sun brand and Olin's bulk isocyanurate business. Olin shall provide the Commission's Bureau of Competition with quarterly and annual financial statements for the Sun brand and Olin's bulk isocyanurate business, and capital spending reports for the South Charleston Isocyanurate Plant and the Livonia Repackaging Operations. All such books, records and statements will be kept in a manner consistent

with Olin's standard accounting practices. In addition, Olin shall provide the Commission with copies of all licensing agreements between Olin and Chlor-Chem, and all contracts or agreements between Olin and any other producer(s) of cyanuric acid, trichlor or dichlor relating to the purchase, sale, transfer or exchange of cyanuric acid, trichlor or dichlor between Olin and that producer or producers.

[12]

7. Disposal or Encumbrance of Assets

The Isocyanurate Assets shall not be sold, transferred, or otherwise disposed of by Olin to any third party, except in the ordinary course of business, without the prior written approval of the Commission; provided, however, that nothing in this Agreement shall prohibit Olin from transferring technology to Chlor-Chem in a manner consistent with the purposes of this Agreement. With respect to any such technology transferred to, or developed within, Chlor-Chem, Olin agrees to transfer said technology, in such a manner, and under such terms and conditions, that Olin retains the right to divest itself of said technology, including all improvements thereto, should the Commission order said divestiture. In addition, Olin shall not mortgage, pledge, or incur liens against the Isocyanurate Assets or any portion thereof as security for any indebtedness of Olin or pursuant to any loan transaction, unless the proceeds are utilized entirely for the Isocyanurate Assets operation.

8. Confidential Information

Olin shall hold in strict confidence and shall not, without prior written Commission approval, divulge to any third party, with the exception of Chlor-Chem, any Material Confidential Information about the Isocyanurate Assets that Olin may obtain from its ownership of those assets; provided, however, that Olin may disclose Material Confidential Information to consultants, contractors or suppliers retained by Olin.

9. Access By Commission

For the purpose of ensuring compliance with this Agreement, Commission counsel or other authorized representatives shall be permitted, upon written request and on reasonable notice to Olin, (a) access, during office hours of Olin, to all ledgers, books, accounts, correspondence, memoranda and other documents in the possession or

under the control of Olin relating to any matters contained in this Agreement and reasonably [13] related to Olin's compliance with this Agreement, and (b) to interview appropriate officers and employees of Olin and managerial personnel responsible for supervision of the Isocyanurate Assets, at their place of employment, or at another mutually agreeable site, regarding matters not privileged which are covered by this Agreement.

10. Undertaking Not To Sue

The Commission agrees that it will not seek a temporary restraining order or preliminary injunction barring consummation of the Asset Acquisition, and will not otherwise seek to delay or prevent consummation of the Asset Acquisition.

11. General Provisions

(a) Nothing contained herein shall constitute an admission of fact or law by Olin with respect to the legality of the Asset Purchase Agreement, the Asset Acquisition, or the Monsanto Tolling Agreement;

(b) In any action brought by the Commission in a United States District Court to enforce this Agreement, Olin waives its right to contest personal jurisdiction, venue, and the validity or enforceability of this Agreement; and

(c) Nothing herein shall be construed to derogate from the Commission's right or authority to challenge, or to authorize the challenging of, the Asset Purchase Agreement, the Asset Acquisition, or the Monsanto Tolling Agreement in a Commission administrative proceeding. [14]

The undersigned signatory for Olin certifies that he has been duly authorized to enter into and execute this Agreement. The undersigned signatory for the Commission certifies that he has been duly authorized by the Commission to enter into and execute this Agreement.

OLIN CORPORATION

FEDERAL TRADE COMMISSION

By: /s/

By: /s/

Chairman and CEO

Exhibits A and B Contain Confidential Information

INITIAL DECISION BY

MONTGOMERY K. HYUN, ADMINISTRATIVE LAW JUDGE

DECEMBER 17, 1987

INTRODUCTION

On July 18, 1985, the Federal Trade Commission issued an administrative complaint challenging the acquisition by Olin Corporation ("Olin") of the swimming pool chemicals assets and business of FMC Corporation ("FMC") as a violation of Section 7 of the Clayton Act, as amended, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45. The complaint charged that the acquisition may substantially lessen competition in two markets: (1) the "manufacture and sale of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers" in the United States and (2) the "manufacture and sale of chlorinated isocyanurate dry swimming pool sanitizers" in the United States. (Complaint ¶¶ 13-14) Olin filed its answer to the complaint on August 28, 1985, admitting in part, and denying in part, the various allegations of the complaint.

After extensive discovery conducted in this country and abroad and completion of other pretrial steps, evidentiary hearings began on January 20, 1987 and concluded on April 28, 1987, with some 52 hearing days. Testimony was heard from a total of 41 witnesses (complaint counsel called 14 witnesses and respondent called 27 witnesses). The record, encompassing some 9,945 pages of hearing transcripts and over 755 exhibits, was closed on June 2, 1987. Subsequently, the parties filed Proposed Findings, Conclusions and Order, with Briefs and Replies. The Commission extended the due date of an initial decision until December 17, 1987.

This initial decision sustains the essential allegations of the complaint, finds a violation of Section 7 of the amended Clayton Act and Section 5 of the amended Federal Trade Commission Act and recommends a partial divestiture order.

With respect to the product market issue, it is determined that the production and sale of isocyanurates for residential pool use is a valid Section 7 market and that the production and sale of isocyanurates and/or calcium hypochlorite for residential pool use (the so-called dry

pool chemicals) also constitutes a valid Section 7 market for the purposes of this case. Pool bleach (sodium hypochlorite) is excluded for the reason that it still remains what it has been for decades, namely an essentially local or regional product and that it does not compete with isocyanurates or calcium hypochlorite on a national basis.

With respect to the geographic market issue, it is determined that the United States is a valid Section 7 market. Respondent's suggestion of a world-wide market is rejected. [2] However, in view of the historically substantial imports of isocyanurates and calcium hypochlorite for pool use, import competition was fully taken into account in assessing the competitive effects of the challenged acquisition.

The market shares and concentration data in the relevant markets show that the challenged acquisition left only two domestic firms in the isocyanurates market, with a combined capacity (including that of Olin's waterbatched plant) approaching 86%. In the isocyanurates-calcium hypochlorite market, the acquisition left three domestic firms, with a combined capacity (including that of Olin's waterbatched plant) in excess of 91%, with the two top firms accounting for almost 76%. If we were to exclude Olin's waterbatched isocyanurate plant, the top two and three firms would account for about # # and # #, respectively. Thus, on the basis of any accepted measure of market concentration, the challenged acquisition has such a high probability of substantial anticompetitive effects that it does not pass muster under Section 7, unless relevant qualitative or non-market share factor or factors demonstrate that the market share and concentration data substantially overstate or misrepresent the true present and future competitive significance of the merging firms or that qualitative or non-market share factors can reasonably be expected to operate as sufficient constraints upon the market power of the dominant firms including Olin.

On that score, the evidence is clear that entry barriers are high with respect to the isocyanurate market and remain substantial with respect to the dry pool chemicals market. Furthermore, price competition appears limited and the relevant markets are characterized by a number of significant collusion-facilitating features. On balance, the relevant non-market share factors tend to confirm, and reinforce, the strong presumption of substantial lessening of competition flowing from the market share and concentration analysis.

Finally, respondent's "efficiencies" defense and "exiting asset" defense are both rejected for the reason that (1) there is no substantial evidence establishing that substantial economies or efficiency gains resulted from the acquisition or that the alleged efficiencies are unique to this acquisition and (2) the record as a whole shows that alternatives to the challenged acquisition were available to Olin and FMC at the time of the acquisition.

As for relief, it is determined that the customary divestiture of the acquired assets and business is appropriate. The administrative law judge is of the view that full restoration of competition in the relevant markets and the need to insure the [3] viability of the divested business require that the divestiture include the acquired assets related to the production of cyanuric acid so as to enable the purchaser to enter the market with cyanuric acid production capacity. However, respondent should be allowed to retain the Sulfolane process technology for the manufacture of cyanuric acid inasmuch as the divestiture package will include the dry pyrolysis process technology acquired from FMC.

Having considered the entire record evidence and having observed the demeanor of the witnesses who appeared and testified in this case, the administrative law judge makes the following Findings on the basis of the record evidence as a whole.¹ [4]

¹ Certain abbreviations were used by way of reference to the record. The testimonial and documentary evidence also contain a number of abbreviations, acronyms and terms used in the trade. They are as follows:

- CB — Complaint counsel's supporting brief.
- CPF — Complaint counsel's Proposed Findings.
- CRB — Complaint counsel's reply brief.
- CX — Complaint counsel's exhibit.
- RB — Respondent's supporting brief.
- RPF — Respondent's Proposed Findings.
- RRB — Respondents' reply brief.
- RX — Respondent's exhibit.

In camera information in the textual material is indicated by # at the beginning and at the end. Record citations referring to *in camera* testimony and exhibits are similarly indicated by # following each such reference.

ACL—The acronym by which Monsanto refers to its isos business.

The Acquisition—Olin's acquisition of the swim pool sanitizer business (and assets) of FMC Corporation.

Ad Hoc Committee—the Isocyanurate Industry Ad Hoc Toxicity Committee; an organization of chlorinated isocyanurate producers and marketers.

Annual Nameplate Capacity—For pool sanitizer plants, the annual output that a plant is designed to produce.

Annual Practical Capacity—For pool sanitizer plants, the annual output that a plant is capable of producing, giving consideration to planned outages, maintenance and repairs.

APC—Azote et Produits Chimiques.

(footnote cont'd)

AvCl—Available chlorine.
 Baleco—Baleco International, Inc.
 BASF—BASF Wyandotte Corporation.
 Bay State—Bay State Pool Supplies.
 Benson Pump—Benson Pump Company.
 Bio-Lab—Bio-Lab Incorporated.
 Bleach—sodium hypochlorite; may also be referred to as “sodium,” “liquid bleach,” “pool bleach,” or “soda bleach.”
 Bromine—Bromochlorodimethylhydantoin; may also be referred to as “BCDMH.”
 CA—Cyanuric acid; may also be referred to as “CYA,” “ICA,” “ICYA,” “isocyanuric acid,” or “acid.”
 CAR—Capital Appropriations Request.
 Cal Hypo—Calcium hypochlorite; may also be referred to as “CH.”
 CDB—Chlorinated Dry Bleach; the acronym by which FMC referred to its isos business; may also be referred to as “CDB/Sun.”
 CdF Chimie—CdF Chimie, S.A.
 Chem Lab—Chem Lab Products.
 ChemQuip—ChemQuip, Inc.
 Chem Systems—Chem Systems, Inc.
 China National—China National Chemical.
 Chlor-Chem—Chlor-Chem Limited.
 Chlorinated isocyanurates—Trichloroisocyanuric acid and sodium dichloroisocyanurate, collectively; may also be referred to as “isocyanurates,” “iso” or “isos.”
 CIF—Carrier Insured Freight.
 Coastal—Coastal Industries, Inc.
 CPR—Competitive price request.
 D&R—D&R Sales.
 Delsa—Derivados Electroquimicos Levante, S.A.
 Dichlor—Sodium dichloroisocyanurate; may also be referred to as “dichloro,” “di,” “SDCC,” “sodium dichloro,” or “NaDCC.”
 DOC—The United States Department of Commerce.
 EPA—The United States Environmental Protection Agency.
 E-Z Clor—E-Z Clor Systems; may also be referred to as “Heldor/E-Z Clor.”
 Fertilizers & Chemicals—Fertilizers & Chemicals Ltd.
 FMC—FMC Corporation.
 FOB—Freight on Board.
 FTC—The United States Federal Trade Commission.
 Granular CA—Refined cyanuric acid that has been granulated for pool use as a commercial stabilizing agent.
 Great Lakes—Great Lakes Chemical Corporation.
 Hasa—Hasa Chemical Company, Inc.
 Horner—Horner Equipment of Florida, Inc.
 HTH—Olin's brand name for calcium hypochlorite.
 Hydrotech—Hydrotech Chemical Corporation.
 ICD—ICD Group, Inc.
 ICI America—ICI America, Inc.; may also be referred to as “ICIA.”
 Inquidesa—Inquidesa, S.A.
 ITA—The International Trade Administration, a division of the Department of Commerce; may also be referred to as “ITA (DOC).”
 ITC—The United States International Trade Commission; may also be referred to as “USITC.”
 Jones Chemical—Jones Chemical Company.
 Lithium—Lithium hypochlorite.
 Midstate—Midstate Chemical and Supply Corporation.
 Mitsubishi—Mitsubishi group of companies of Japan.
 Mitsubishi International—Mitsubishi International Corporation.
 Monsanto—Monsanto Company.
 NCP—N-cyclohexylpyrrolidone; a solvent used in the production of cyanuric acid.
 Netback—The total revenue realized from the sale of all sizes of a product, less commission, freight, discounts and early buy allowances; may also be referred to as “nets.”

(footnote cont'd)

1. THE FIRMS INVOLVED IN THE CHALLENGED ACQUISITION

A. Respondent Olin Corporation and Its Business

1. Olin Corporation ("Olin") is a corporation organized under the laws of the State of Virginia with its [5] principal place of business at 120 Long Ridge Road, Stamford, Connecticut. Olin has plants and offices in a number of states, including Alabama, Arizona, California, Connecticut, Florida, [6] Illinois, Louisiana, Michigan, Missouri, New York, Pennsylvania, Rhode Island, Tennessee, Washington, and West Virginia. Olin also has plants and offices in several foreign countries. [7] (Complaint ¶ 2; Answer ¶ 2; CX 678-D, E, F, G, T, U, V, W, Z14; CX 679-D, E, F, O, P, Q, R, Z9)

2. Olin manufactures and sells chemicals, metals, ammunition, and defense-related products. Chemical products include commodity and specialty industrial chemicals and water treatment products, services,

Nippon Soda—Nippon Soda Ltd.

Nissan—Nissan Chemical Industries, Ltd.

N. Jonas—N. Jonas Co., Inc.

NuClear—NuClear Pools.

Olin—Olin Corporation.

PACE—Olin's brand name for isocyanurate.

Powdered Ca—Refined cyanuric acid in powder form that is used as a basic raw material in the manufacture of chlorinated isocyanurates. Unless otherwise indicated, all references to merchant CA pertain to CA in powder form.

PPG—PPG Industries, Inc.

Private Label—The label and consumer-sized package developed for a distributor or retailer by a producer or repacker using that distributor's or retailer's own brand name; after the package and label are developed, the producer or repacker fills the package for resale by the distributor or retailer.

Quimica ROT—Quimica ROT de Mexico.

Repacker—Repackager.

Saskatoon—Saskatoon Chemical Co.

Shasta—Shasta Industries.

Shikoku—Shikoku Chemicals Corporation.

Shikoku International—Shikoku International Corporation.

Sigma—Sigma Prodotti Chimichi, SpA.

South Charleston—FMC's CA, dichlor and trichlor plant in South Charleston, West Virginia; may also be referred to as "South Charleston plant."

Sparkling—Sparkling Pools.

Steelcrete—Steelcrete Company.

Suffolk—Suffolk Chemical Company.

Sumitomo (Japan)—Sumitomo Corporation of Japan.

Sumitomo—Sumitomo Corporation of America.

SUN—FMC's brand name for isocyanurate acquired by Olin.

Surpass—Surpass Chemical Co., Inc.

3-V—3-V Chemical Corporation.

Toyomenka—Toyomenka America, Inc.

Toyomenka (Japan)—Toyo Menka Kaisha, Ltd.

Toyo Soda—Toyo Soda Manufacturing Co., Ltd.

Trichlor—Trichloroisocyanuric acid; may also be referred to as "trichloro," "tri," "TCCA," or "TICA."

TVA—Temporary voluntary allowance.

York—York Chemical Corporation.

and equipment. Metal products include copper alloy, sheet, strip, tube and fabricated parts, nickel alloys, and stainless steel strip. Ammunition includes both sporting and defense ammunition. (Complaint ¶ 3; Answer ¶ 3; CX 678-T, U, V, W; CX 679-O, P, Q, R, S; Henske, Tr. 7091-92)

3. In 1984, the last full fiscal year prior to the acquisition, Olin had \$2.1 billion in net sales and \$1.6 billion in assets. Olin's 1984 after tax profits were \$88.7 million. (Answer ¶¶ 2, 3, 4; CX 678-Z2, Z10) Because of a major corporate restructuring and substantial asset write-offs, Olin had losses in 1985 of \$165.3 million. (CX 679-X)

4. Olin's Chemicals Group develops, manufactures and markets industrial chemicals, specialty chemicals and water treatment chemicals. (Henske, Tr. 7091-92) In 1985, the Chemicals Group had \$1.1 billion in sales and reported an operating profit of \$46.2 million. (CX 679-W; Henske, Tr. 7092-93)

5. Within Olin's Chemicals Group is the Water Products and Services Division, which includes Olin's swimming pool chemicals business. Olin's Water Products and Services Division was known as Olin's Consumer Products Group until May of 1985, when Olin's water services business was added to the group and the current name was adopted. (CX 474-D#) Among the industrial chemicals that Olin produces are three chemicals which are important in the manufacture of pool chemicals: (1) chlorine, (2) caustic soda and (3) urea. (Turnipseed, Tr. 7868#)

6. Olin's pool chemicals business consists of the manufacture, packaging, distribution, marketing and sale of the dry sanitizers, calcium hypochlorite ("cal hypo") and chlorinated isocyanurates ("isocyanurates" or "isos"). (CX 439#) Annually, Olin's swimming pool chemical sales amount to \$100-\$150 million. (Henske, Tr. 7092-93)

7. Olin markets its calcium hypochlorite and isocyanurate products to the swimming pool trade through a common sales force. (CX 9-Q; CX 653-H#; Turnipseed, Tr. 7732) # # (CX 660#) Olin's 1984 Annual Report stated results for the company's [8] "pool chemicals business." (CX 678-D, U) In full awareness of its # # (CX 394-D#) An Olin company profile, being prepared at the time of acquisition, asserted that # # (CX 481-E#) Olin primarily markets calcium hypochlorite under the HTH brand and isocyanurates under the PACE and, subsequent to the acquisition, SUN brand. (CX 439-A-B#)

8. For the purposes of this proceeding, Olin's relevant production

facilities are its manufacturing plants located at Lake Charles, Louisiana, South Charleston, West Virginia, and Charleston, Tennessee. In addition, relevant Olin nonmanufacturing facilities are its packaging plant at Livonia, Michigan and the corporate headquarters at Stamford, Connecticut, which also headquarters personnel responsible for Olin's swimming pool sanitizer business. (Kosche, Tr. 9031-34#; Johnstone, Tr. 6389#; RX 32-C#; Kennedy, Tr. 433; Fortuna, Tr. 7945#; Kosche, Tr. 8290-91; Swartley, Tr. 6875-77; CX 441-A, B, C#; CX 450-G#; CX 678-U; CX 679-Q; CX 700-A#)

9. Olin has been a producer of calcium hypochlorite since 1928. (CX 377-F#) Olin began manufacturing cal hypo at a plant in Niagara Falls, New York around 1927. (Turnipseed, Tr. 7462-63) # # (CX 473-H; RX 32-C#; Kosche, Tr. 9031-34#;)

10. Olin currently operates a calcium hypochlorite production facility in Charleston, Tennessee, which is the largest such facility in the world. (CX 548-A, E; CX 652-E#) Olin's competitive assessment studies conclude # # (Henske, Tr. 7243#) Olin also owns 50% of Aquachlor, a calcium hypochlorite facility in the Republic of South Africa. (CX 441-D#)

11. In 1984, Olin produced # # pounds of calcium hypochlorite at its Charleston plant, which amounted to almost # #% of the calcium hypochlorite manufactured in the United States. (CX 441-I#; CX 652-K, L#) In 1985, Olin's annual cal hypo production capacity at Charleston was approximately # # pounds, which constituted about # # of domestic cal hypo capacity. (CX 441-J#; CX 652-B, E#) Including its interest in Aquachlor, Olin possessed approximately # #% of world cal hypo capacity in 1985. (CX 652-B, E#) [9]

12. Olin sells cal hypo in both branded and bulk form. The branded cal hypo is sold to repackers, distributors and retailers under several Olin brand names, including HTH, Pulsar and CCH. Olin also sells private label cal hypo to certain repackers, distributors and retailers. (CX 377-P#) Branded cal hypo is sold in numerous consumer-sized containers up to 100-pound drums. Olin also sells cal hypo to repackers in bulk form.

13. Olin is well-recognized as the leading firm in the calcium hypochlorite pool chemical business. (CX 119-L; CX 549-C; CX 613-A#; Marshall, Tr. 1156, 1158; Jonas, Tr. 2269; Castagnolli, Tr. 2454-56; Hughes, Tr. 5250, 5353; Hammersmith, Tr. 6144-45; Henske, Tr. 7156, 7168#) Olin's HTH is the only brand of calcium hypochlorite to command a premium price in the pool chemicals market. (CX 660-C#; Hughes, Tr. 5304)

14. In 1979, Olin entered the production of isocyanurates as a natural outgrowth of its calcium hypochlorite swimming pool sanitizer business. (RX 35-P-Q#; Kosche, Tr. 8315) The isocyanurate facility, located in Lake Charles, Louisiana, is considered by Olin # # (CX 472-R-T#; CX 473-L; Swartley, Tr. 7059-61#; Henske, Tr. 7199#) And Olin's isocyanurate business was considered to be a # # (CX 394-B#)

15. Olin constructed CA, dichlor and trichlor manufacturing plants and a packaging plant at Lake Charles, Louisiana in the 1977-1980 time period. Originally, the Lake Charles facility was designed to manufacture CA, dichlor, and trichlor and to package all three products. (Johnstone, Tr. 6261-62; Kosche, Tr. 8295, 8309-11) Olin closed its CA plant in 1980, and ceased its dichlor operation in 1982 and its trichlor operation in August, 1984. Olin reopened that plant after its acquisition of FMC's pool chemicals business in November, 1985. (Kosche, Tr. 8498-99#, 9021-24#; CX 330-A, B, I; CX 402; CX 679-Q) Currently, the # #. (Fortuna, Tr. 8084#; Kosche, Tr. 9042#; CX 450-G#) Olin's South Charleston plant was acquired from FMC in 1985 as part of the acquisition. Olin manufactures CA and dichlor at that plant. Olin also acquired the Livonia isocyanurate packaging facility as part of the acquisition. Olin packages branded isos at that plant. (RX 341#; CX 450-G#; CX 679-Q)

16. On July 1, 1984, Olin and Monsanto Company concluded a tolling agreement ("Monsanto Toll"), whereby Monsanto was to produce isocyanurates for Olin using Olin's raw materials with Olin paying a fee for the conversion. (CX 469#) Then, on [10] or about July 7, 1984, Olin announced that, effective August 1, 1984, it will suspend PACE production at its Lake Charles trichlor plant "until further notice." (CX 402) The announcement indicated that, until it resumed isos production, Olin would market isos obtained from an unnamed manufacturer under a raw materials tolling arrangement. (CX 402) The announcement explained that "this action was taken for economic reasons since current conditions favor contract tolling the product for an interim period instead of manufacturing it." (CX 402) During the interim period, Olin stated that the Lake Charles trichlor facility would "be kept in stand-by condition." (CX 402)

17. Olin kept its Lake Charles trichlor plant out of operation from on or about August 1, 1984, until after it had consummated the challenged acquisition. (Kosche, Tr. 8953#) However, Olin maintained the facility in a "waterbatched" condition to assure that the facility

could resume production within sixty to ninety days. (Johnstone, Tr. 6295-96#) Waterbatching (which has been defined as maintaining a plant in a higher state of readiness than mothballing) involves incurring additional expense to circulate water through key operating systems to prevent deterioration. (CX 474-Z2#)

18. Olin sells trichlor and dichlor in both branded and bulk form. Branded isos are sold in consumer-sized packages. Olin's branded isos are sold primarily under the PACE and SUN brand names to distributors and retailers. (CX 267-F#) The SUN brand name was acquired by Olin from FMC in the acquisition. Olin also sells private label isos to certain distributors and retailers. Olin also sells isos to repackers in bulk form. During the period in which Olin's trichlor plant was shut down, Olin only sold branded isos that it purchased from Monsanto pursuant to the Monsanto Tolling Agreement. (Johnstone, Tr. 6294#; Kosche, Tr. 8497#)

19. In the seven-month period that it operated in 1984, Olin's Lake Charles plant produced # # million pounds of trichlor, which constituted approximately # # of total domestic isocyanurate production. (CX 441-I#; CX 652-K#) However, Olin # # (CX 440-A#; Kosche, Tr. 9011-13#)

20. In 1985, Olin's annual trichlor production capacity was approximately # # pounds. (CX 441-J#) This represented approximately # # of domestic isocyanurate capacity and # # of worldwide isocyanurate capacity. (CX 652-A, B#) [11]

21. Olin's sales of PACE in 1984 were estimated to be approximately # #% of total domestic sales of isos, making PACE the second largest national brand of isocyanurate pool chemicals next to FMC's SUN brand. (CX 127-H, J#)

22. During the period from 1980 to 1984, Olin produced and sold the following amounts of isos:

		<u>Production (MM's lbs.)</u>				
		<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Trichlor	#					#
Dichlor	#					#
Total	#					#

(CX 441-E, F, G, H, I#) Olin's trichlor plant was shut down in July, 1984.

23. During the period from 1980 to 1984, Olin produced and sold the following amounts of cal hypo:

Production (MM's lbs.)

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
#					

#

#

(CX 441-E, F, G, H, I#)

24. Olin is engaged in the sale and shipment of isos and cal hypo throughout the United States and the world. Olin is engaged in commerce, and its acts and practices are in or affecting commerce, within the meaning of the Clayton Act, as amended (15 U.S.C. 12), and the Federal Trade Commission Act, as amended (15 U.S.C. 44).

B. Olin's Management Structure

25. John M. Henske, who testified for Olin in this case, was Chairman of Olin's Board of Directors and its Chief Executive Officer at the time the acquisition was consummated. Mr. Henske had held the CEO position since April, 1978, and had been the Chairman of the Olin Board since September, 1981. (CX 657-C#; Henske, Tr. 7090-91) Mr. Henske's direct involvement with Olin's pool chemicals business in various management positions dated back to 1969. (Henske, Tr. 7103) [12]

26. At the time of the acquisition, reporting to Mr. Henske were two executive vice presidents, John Johnstone and Richard Barry, who together with Mr. Henske, comprised Olin's Office of the Chief Executive, also called the CEO Office. (CX 653-K#; Johnstone, Tr. 6249; Henske, Tr. 7095-97) The three members of the CEO Office were also referred to as Olin's corporate management. (CX 653-K#) Each of Olin's operating groups was managed by a group president who reported either to Johnstone or Barry. (Henske, Tr. 7095-96)

27. Mr. Johnstone, who testified for Olin in this case, was elected an executive vice president in June, 1983. (Johnstone, Tr. 6249) One of the operating groups that reported to him was the Consumer Products Group which included Olin's pool chemicals business. (Johnstone, Tr. 6250-51) Prior to becoming executive vice president, Mr. Johnstone had no direct involvement with Olin's pool chemicals business. (Johnstone, Tr. 6250) Olin's swimming pool chemicals business was part of Consumer Products from the early 1970's until assigned to the Chemicals Group during the 1985 reorganization. (Johnstone, Tr. 6251, 6253; Kosche, Tr. 8291)

28. John S. Swartley, who testified for Olin in this case, was President of the Consumer Products Group from November, 1982

until May, 1985, when the group was reorganized. Thereafter, Mr. Swartley continued to manage Olin's pool chemicals business as President of the Water Products and Services Division. (Swartley, Tr. 6876-77) Mr. Swartley first became involved with Olin's pool chemicals business upon joining the company in July, 1982, as Executive Vice President of the Consumer Products Group. Mr. Swartley's predecessor as the President of the Consumer Products Group was Ben Foster. (Swartley, Tr. 6876, 6883) The Consumer Products Group was one of four Olin business operations for which Mr. Johnstone had general management responsibility, businesses with annual sales totalling over a billion dollars. (Johnstone, Tr. 6250, 6263-64) The senior managers of Olin's manufacturing organization and its technology organization both reported to Mr. Johnstone. (Johnstone, Tr. 6250, 6263)

29. Olin's technology organization had responsibility for all research and development activities involving the company's chemicals business. (CX 472-D#) From about 1980 and until he left the company in the summer of 1984, Dr. Kevin O'Leary was the senior manager of Olin's technology organization. (CX 472-D#; Johnstone, Tr. 6267; Kosche, Tr. 8331) Dr. O'Leary was succeeded by Dr. John Marano, who had been working within the technology organization since April, 1982, as Director of Process Technology. (CX 472-D#) [13]

30. Olin's manufacturing organization had direct responsibility for the operation of all of Olin's production facilities, including Olin's Lake Charles Plant. William Oppold was the senior manager of manufacturing from the late 1970's until sometime prior to June, 1983, when he was succeeded by Frank Eakin. (Johnstone, Tr. 6266-67; Kosche, Tr. 8626-28#; Swartley, Tr. 7067-70#)

31. Peter C. Kosche, who testified for Olin, has held several important management positions within Olin's pool chemicals business beginning in 1973. (Kosche, Tr. 8291) Mr. Kosche started in calcium hypochlorite product development, and later managed the HTH sales organization. (Kosche, Tr. 8291-92) Beginning in 1975, Mr. Kosche assumed overall responsibility for planning and implementing the commercial development of Olin's isocyanurate entry. (Kosche, Tr. 8293-94) When Olin formally approved the funding of plant construction in mid-1977, Mr. Kosche became PACE Business Manager. (Kosche, Tr. 8310) In December, 1980, Mr. Kosche was named Director of Marketing and Sales for the Pool Chemicals Business. (Kosche, Tr. 8387#) Sometime in 1983, Mr. Kosche returned to

product development as Director of Commercial Development for Pool Chemicals. (CX 475-E#) From late 1984 to May, 1985, Mr. Kosche was Director of Commercial Development for the Consumer Products Group. (CX 475-D#) With the May, 1985 reorganization, his title changed to Director of Commercial Development for the Water Products and Services Division. (CX 475-D#) Mr. Kosche supervised Olin's due diligence review of the FMC pool chemicals business prior to the consummation of the acquisition. (Kosche, Tr. 8503-04#) After the acquisition, he was named General Manager of Pool Chemicals. (Kosche, Tr. 8516-17#)

32. B. George Turnipseed, who testified for Olin, held a number of marketing positions in Olin's pool chemicals business, from mid-1973 until early 1981. (Turnipseed, Tr. 7459-60) Mr. Turnipseed succeeded Mr. Kosche as PACE Business Manager at the beginning of 1981, and in early 1983 followed Mr. Kosche as Director of Marketing and Sales for Pool Chemicals. (Turnipseed, Tr. 7457-59) After the acquisition, Mr. Turnipseed assumed the position of Director of Marketing for Pool Chemicals. (Turnipseed, Tr. 7456)

33. As the CEO, Mr. Henske received monthly highlight reports from the group presidents. (Henske, Tr. 7097) # # (CX 656-K#; Swartley, Tr. 7416#) Mr. Henske was closely involved in Olin's formal strategic planning process. (Henske, Tr. 7093, 7098) That process required that # # [14] (Henske, Tr. 7097; Kosche, Tr. 8445-46#)

34. Within the operating group, the annual planning cycle began with a planning exercise in March or April. (Swartley, Tr. 6882-83) # # (CX 656-P#) Mr. Turnipseed had # # (CX 474-G#; CX 656-D#)

35. Generally, in the middle of the year the group strategic plans were forwarded to the Vice President of Corporate Planning. (CX 656-S-T#; Henske, Tr. 7099) # # (CX 653-P-Q#; Henske, Tr. 7192-93#) # # (CX 653-Q-R#; Henske, Tr. 7193#) # # (Henske, Tr. 7193#)

36. Mr. Henske would # # (Henske, Tr. 7193#) In reviewing a group's plan, Mr. Henske was most concerned about the validity of the first two years of the plan. (Henske, Tr. 7099-7100) Mr. Johnstone # # (CX 653-N-V#)

37. Whenever appropriate, those in the CEO Office communicated to the particular group president their critique of his strategic plan and typically such corporate feedback would be directed at the first two or three years of the plan. (CX 653-N, Q-R#; Henske, Tr. 7099-7100) # # (CX 653-R#) However, Olin's corporate management # # (Swartley, Tr. 7011-13#) [15]

C. FMC Corporation and Its Business

38. FMC Corporation ("FMC") is a corporation organized under the laws of the State of Delaware, with its principal place of business located at 200 East Randolph Drive, Chicago, Illinois. (Complaint ¶ 7; Answer ¶ 7) FMC operates 112 manufacturing facilities and mines in 27 states and 15 foreign countries. (CX 702-B) FMC manufactures and markets a broad range of industrial chemicals, agricultural chemicals, food machinery, specialized machinery, defense equipment, and petroleum equipment. These various businesses comprise twenty-five business units within the corporation. (CX 702-A-B; Furrer, Tr. 3345-46) In 1984, FMC had total sales of about \$3.3 billion, net income of about \$38 million, and assets of about \$2.4 billion. (Answer ¶ 9; CX 702-A, B)

39. Prior to the acquisition, FMC produced and marketed a number of pool chemicals, including trichlor, dichlor and CA. FMC manufactured CA and isos at its plant at South Charleston, West Virginia and owned a packaging plant at Livonia, Michigan. FMC also owned 50% of the outstanding voting securities of Chlor-Chem Limited ("Chlor-Chem"), a manufacturer of isos located in Widnes, United Kingdom. The remaining 50% of Chlor-Chem's voting securities were owned by FBC (formerly Fisons) Limited, a subsidiary of Schering AG. (Furrer, Tr. 3525; Collins, Tr. 3555-56, 3562-63, 3570; Kosche, Tr. 8732-33#; RX 132-E; H, M, O; CX 700-A, C#; CX 709)

40. The business unit at FMC that was responsible for the production and sale of isos and CA prior to the acquisition was the CDB/SUN business unit of the Specialty Chemicals Division at FMC. The Specialty Chemicals Division, in turn, was one of three operating divisions of FMC's Industrial Chemicals Group. The chain of decisional authority with respect to FMC's swimming pool sanitizer business ran from the CDB/SUN business to the Specialty Chemicals Division to the Industrial Chemicals Group to senior corporate management. (Collins, Tr. 3550-51) FMC began the construction of its isos facility in 1958. (CX 450-B#) It began actual production and sale of isos in the late 1950's or early 1960's.

41. FMC originally sold isos for use as a pool sanitizer in bulk form to repackers, who in turn packaged the isos in consumer-sized units. FMC sold the bulk isos as a powder in 300 pound drums or 2200 pound bins. (Collins, Tr. 3568-69)

42. In 1978, FMC acquired the repackaging operations of Sun Cleanser Company and began to repackage and sell isos under the

400

Initial Decision

SUN brand name in competition with the repackers who had been FMC's bulk pool chemical customers. FMC also obtained the [16] repackaging plant at Livonia, Michigan, together with all other tangible and intangible assets of that company. (CX 54; Collins, Tr. 3570)

43. During the period from 1980 to 1984, FMC produced and sold the following amounts of isos:

		<u>Sales (MM's lbs.)</u>				
		<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Swim Pool	#					#
Industrial	#					#
Total Isos	#					#

		<u>Sales Revenues (\$MM's)</u>				
		<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Total Isos	#					#

(CX 707-I, Z19, Z22#)

44. In 1984, FMC's South Charleston plant produced about # # million pounds of isocyanurates, which constituted about # # of domestic iso production. (CX 64-Z37; CX 652-K#) It has been estimated that FMC's 1984 sales of SUN brand isocyanurate pool sanitizers constituted approximately # #% of total domestic isocyanurate pool sanitizer sales, making SUN the largest national brand of such pool sanitizers. (CX 127-J#)

45. In 1985, isocyanurate production capacity at South Charleston was an estimated # # million pounds or about # # of domestic iso capacity. (CX 64-Z33, Z34; CX 652-A#) Including its Chlor-Chem interest, FMC's share of world isocyanurate capacity was about # # in 1985. (CX 652-B#)

D. FMC's Management Structure

46. From at least 1980 to the time of the acquisition, R.H. Malott was FMC's Chairman and Chief Executive Officer and R.C. Tower was its President and Chief Operating Officer. (Furrer, Tr. 3364-65) John R. Furrer, who testified for Olin, was FMC's Vice President for Corporate Development and had held that position since 1977. (Furrer, Tr. 3343) Mr. Furrer's responsibilities included corporate planning, business unit planning, and acquisitions and divestitures.

(Furrer, Tr. 3343) Mr. Furrer reported directly to the CEO. (Furrer, Tr. 3343). [17]

47. At the time of the acquisition, FMC's isos business was designated the "CDB business" (for chlorinated dry bleach) and was also identified as "CDB" or "CDB/SUN." (Collins, Tr. 3554, 3713) The CDB business was part of the Specialty Chemicals Division which, in turn, was part of FMC's Industrial Chemicals Group. (Collins, Tr. 3550-51) In FMC business records, the two organizations are identified by their initials, "SCD" and "ICG," respectively. (CX 664-C)

48. William A. McMinn was the ICG Group Manager at least since 1980. (Furrer, Tr. 3358, 3364) From 1980 until late 1983, John J. Randolph was the SCD Division Manager. His successor was Robert Harries. (Furrer, Tr. 3364; Collins, Tr. 3556)

49. James R. Collins, who testified for Olin, was the SUN general manager from 1981 until late 1983. (Collins, Tr. 3554) In that position, Mr. Collins was responsible for the marketing of SUN pool chemicals throughout North America. (Collins, Tr. 3555) In late 1983, Mr. Collins was named the CDB Business Director and given responsibility for the marketing of all FMC's isos. (Collins, Tr. 3555, 3713)

50. At the time of the acquisition, John M. Polkowski was the marketing manager for industrial and international CDB's, which position he had held since 1983. (CX 478-E) Mr. Polkowski also served on the Chlor-Chem Operating Committee. (CX 478-S-T) Mr. Polkowski was hired by Olin after the acquisition. (CX 478-C)

51. The South Charleston isocyanurates facility was the operational responsibility of Norm Marsh, FMC's Director of Manufacturing. The South Charleston plant manager reported to Mr. Marsh, and not to Mr. Collins. (Collins, Tr. 3558)

52. FMC employed a formal planning procedure that required each division to prepare a strategic plan every two years, which was forwarded to Mr. Furrer's office for critical review. When his office had completed its analysis, the plan was formally presented to corporate management, including the CEO, the chief operating officer, and the chief financial officer. (Furrer, Tr. 3352-53)

53. After the formal presentation of the strategic plan to corporate management, the planning process was finalized with the execution of a "master contract" between corporate management and the business unit, confirming the operating guidelines of the business for the two-year plan period. (Furrer, Tr. 3367) [18]

54. Prior to the acquisition, FMC was engaged in the sale and shipment of isos throughout the United States and the world. For purposes of this proceeding, FMC was engaged in commerce throughout the relevant time period, and FMC's acts and practices were in or affecting commerce, within the meaning of the Clayton Act, as amended (15 U.S.C. 12), and the Federal Trade Commission Act, as amended (15 U.S.C. 44).

II. OLIN'S ACQUISITION OF FMC'S ASSETS AND BUSINESS RELATED TO THE MANUFACTURE AND SALE OF CHLORINATED ISOCYANURATES

A. *Acquisition Negotiations*

55. On February 7, 1985, Olin and FMC signed a letter of intent, which set forth the parties' mutual intent for Olin to buy FMC's pool chemicals business and related assets for approximately \$49.5 million, less adjustments (the "Letter of Intent"). (Complaint ¶ 12; Answer ¶ 12; CX 700#) The proposed transaction was announced on March 4, 1985. (CX 764) Pursuant to the Letter of Intent, Olin agreed to buy, and FMC agreed to sell, FMC's CA, trichlor, and dichlor production facilities at the South Charleston plant (the "South Charleston plant" or "South Charleston"), the repackaging facilities in Livonia, Michigan, the SUN brand name and other brand names used by FMC to identify CA, trichlor and dichlor, the Sulfolane technology for the production of CA, and the 50% interest in Chlor-Chem held by FMC. (Answer ¶ 12; CX 700-A#) Olin also agreed to buy FMC's chlorine and caustic business assets, but that portion of the proposed transaction was subsequently cancelled. (Furrer, Tr. 3414; Johnstone, Tr. 6458-61#; CX 405-C#; CX 700-A#; CX 753#) The acquisition was consummated on August 16, 1985. (Answer ¶ 12)

56. The discussions which led to the acquisition arose "probably early 1984," in a conversation between FMC's Chief Operating Officer, Raymond Tower, and either Olin's John Johnstone or John Henske. (Furrer, Tr. 3411) In that initial high-level Olin/FMC communication, "an understanding that there might be an interest in Olin purchasing [FMC's swimming pool] business was established." (Furrer, Tr. 3410) Also, Mr. Tower told the Olin corporate management official that John Furrer, FMC's Vice President of Corporate Development, would be responsible for any negotiations that developed. (Furrer, Tr. 3411)

57. In a telephone conversation sometime prior to June 28, 1984, FMC's William McMinn told Olin's William Schmitt [19] that FMC was

definitely interested in selling some of its chemical facilities, including possibly its South Charleston isocyanurate plant. (Johnstone, Tr. 6302-03, 6458#) On or before June 28, 1984, Olin's John Johnstone was told the details of the McMinn/Schmitt conversation (CX 537; Johnstone, Tr. 6457-58#) and discussed the matter with his CEO, John Henske. (Johnstone, Tr. 6311#) It also appears that before the direct communication from FMC's McMinn, Olin was aware of the possible FMC isocyanurate acquisition opportunity. In early October, 1983, in a slide presentation to CEO Henske, the acquisition of FMC's isocyanurate operation was mentioned as one of three Olin "business options" for achieving "market price improvement." (CX 396-D#; Swartley, Tr. 6984-85, 7420-21, 7427#)

58. When Mr. Henske learned of the McMinn phone call, he encouraged Mr. Johnstone to go forward with efforts to acquire the FMC isocyanurate facilities. (Johnstone, Tr. 6311#) Mr. Johnstone directed John Swartley, Olin's Consumer Products Group President, to contact FMC for further details. (Swartley, Tr. 7434-35#) Within a week or two of receiving the assignment from Mr. Johnstone, Mr. Swartley met with a subordinate of Mr. McMinn's and confirmed that, definitely, the South Charleston isocyanurate assets were for sale. (Johnstone, Tr. 6463#; Swartley, Tr. 7434-35#)

59. By July 26, 1984, an Olin pool chemicals market statistics specialist was preparing and circulating market concentration estimates for pool chemicals using the Herfindahl-Hirschmann Index ("HHI"). (CX 873#; CX 874-R#; Kosche, Tr. 9028, 9031#) By August 7, 1984, Mr. Swartley's financial staff had put together a preliminary assessment of the value of the assets being offered for sale by FMC, identified investment needs and plant change proposals and recommended a strategy for purchase price negotiation. (CX 538-A-C#; Johnstone, Tr. 6466#) In a letter to FMC, dated August 13, 1984, Mr. Swartley sought additional details concerning the FMC assets. (Swartley, Tr. 7435-36#) FMC sent Olin information regarding its pool chemicals business assets. Olin reviewed the material "for several weeks." (Furrer, Tr. 3412)

60. In September, 1984, Johnstone and Furrer held a negotiating session at Olin corporate headquarters. (Furrer, Tr. 3412-13; Johnstone, Tr. 6305) Mr. Furrer later testified, "At that time, [Johnstone] offered to buy the business from us at a price which seemed to be in the ballpark." (Furrer, Tr. 3413) There followed a second Johnstone/Furrer negotiating session to resolve details concerning which

FMC assets were to be included in the acquisition. (Furrer, Tr. 3413) [20]

61. Drafts of a letter of intent were prepared and exchanged in December, 1984. (Kosche, Tr. 8750-51#) Olin's Board of Directors was notified of the developing negotiations on December 13, 1984. (CX 263-A#; Kosche, Tr. 8750#) On February 8, 1985, Olin and FMC officials executed the Letter of Intent. It called for Olin to pay \$49.5 million for the assets to be acquired, less certain adjustments for inventory and accounts receivable. In addition, the Letter of Intent allowed a downward adjustment of price in excess of \$2 million should FMC be unable to obtain the consent of Schering AG to the transfer to Olin of FMC's interest in Chlor-Chem. (CX 700-C, D, E#) As part of the Letter of Intent, Olin also agreed to make royalty payments to FMC for five years should Olin begin commercial production of CA in the United States utilizing FMC's Sulfolane technology. The price paid by Olin was within the range of values that Olin placed upon the CDB/SUN business. By its own estimates, Olin valued the business at # #. The sum included an estimated # # in synergistic gains resulting from the unique benefit to Olin of finally obtaining the CA supply and technology that had eluded it for so many years. (CX 405-L#; CX 661-Q#; CX 700-C#)

62. Once the Letter of Intent was signed, Olin began to undertake its due diligence review of the assets it intended to purchase. Olin's due diligence efforts were led by Mr. Peter Kosche and Mr. Richard A. Campbell, Olin's plant manager at Lake Charles, who went to the South Charleston plant personally and supervised a team of technical personnel from Olin investigating the condition of the South Charleston plant. (Kosche, Tr. 8503-10#; CX 839-E#)

63. On March 4, 1985, Olin issued a public announcement that, pursuant to "an agreement in principle," Olin was buying FMC's pool chemicals business. (CX 764)

B. Asset Maintenance Agreement

64. On July 18, 1985, the FTC issued the Complaint challenging the acquisition. FMC was not named as a respondent. On July 20, 1985, Olin and the FTC signed an asset maintenance agreement pursuant to which the Commission agreed not to seek to enjoin consummation of the acquisition, thereby permitting Olin to acquire and operate FMC's swimming pool chemicals business pending resolution of the Commission's administrative complaint in this matter. In return, Olin agreed

to withdraw from the Monsanto Toll and to manage the acquired assets in accordance with certain requirements intended to preserve the Commission's ability to obtain effective divestiture. The asset maintenance agreement permitted Olin to consolidate FMC's business with its business and its then-closed [21] production facilities pending the outcome of the administrative proceeding, provided that Olin maintain FMC's business and assets in the condition existing at the time of the acquisition. The acquisition was consummated on August 16, 1985.

III. AN OVERVIEW OF THE SWIMMING POOL CHEMICALS INDUSTRY

A. *Swimming Pool Sanitization and Products—A Market History*

65. The purpose of pool sanitization is to kill bacteria and algae in the pool water. (RX 43-X; Kennedy, Tr. 453-54) Chlorine is a very effective sanitizer and is the principal active ingredient used most often to sanitize swimming pools. (Christensen, Tr. 1756) However, certain nonchlorine-based pool sanitizers, such as bromine, are also sold. (Marshall, Tr. 1112, 1142; Jonas, Tr. 2235-37; Pettoruto, Tr. 1491-92) Chlorine sanitizes a pool by reacting to and combining with organic materials in the pool water to form chloromenes. The United States Environmental Protection Agency ("EPA") recommends that the pool chlorine level be maintained at between one and three parts of chlorine per one million parts of pool water; the conventional recommended dosage of chlorine for daily maintenance of a pool varies from one to two parts of chlorine per each million parts of pool water. (CX 10-R; CX 257-G; CX 555-D; Kennedy, Tr. 454-55; Aston, Tr. 4573-75)

66. There are two phases of swimming pool sanitization: one phase referred to as primary, maintenance or routine sanitizing, and a second phase referred to as superchlorination or shocking. (Christensen, Tr. 1824; Jonas, Tr. 2213) Primary sanitization is the regular addition of sanitizer to the pool in order to maintain the pool in a condition considered safe for swimming. (Kennedy, Tr. 454; Jonas, Tr. 2213) In the case of chlorine sanitizing, this requires maintaining a chlorine level of 1 to 3 parts per million ("PPM"). (CX 257-G)

67. Shocking or superchlorination is the intermittent addition of sufficient sanitizer to the pool to eliminate accumulations of contaminants. (Kennedy, Tr. 454) Shocking a pool with a chlorine sanitizer requires the addition of enough sanitizer to temporarily raise the

chlorine level to 5-20 ppm (CX 258), a level too high for swimming. (Christensen, Tr. 1824) It is generally recommended that a pool receive shock treatment every two weeks. (CX 257-G; CX 283-D-E#) Under some conditions, such as heavy bather load or heavy rain, shocking could be advisable once a week. (CX 258; *see generally* CX 10; CX 257) [22]

68. Most pool sanitizer consumption is for the purpose of primary sanitization. (Hammersmith, Tr. 6026) Ancillary chemicals (such as algicides, pH adjustors, stabilizers, and conditioners) used to perform complementary functions are sold to consumers along with sanitizing chemicals. (CX 649-C; CX 650-E-F; CX 687-F-J; Christensen, Tr. 1767-68; Vonderlow, Tr. 4764-65; Wetzel, Tr. 5370)

69. Most pool sanitizers, including isos, bleach and cal hypo, alter the pH of the pool water. PH is the measure of the acid/alkali balance in the pool water. (CX 258) The pH level of pool water affects the level of free chlorine available to accomplish sanitization. The higher the pH level, the more chlorine is required to accomplish the sanitization. The recommended pH level for pool water is 7.2 to 7.6 or 7.8. (CX 555-D; CX 10-Z29; CX 258) If the pH in pool water is below 7.2, it is too acid and can "result in corrosive water which can etch or stain plaster, corrode metal, and cause eye, ear, nose or throat irritation. Too high a pH can cause cloudy water, scale formation, eye irritation and slow down the range of bacteria kill." (CX 555-D) Therefore, consumers must adjust the pH of their pool water. (Kennedy, Tr. 484-86, 598) The frequency of adjustment required to maintain the proper pH level is basically the same for all pool sanitizers. (Hughes, Tr. 5209)

70. Trichlor and chlorine gas decrease the pH level of pool water. Dichlor also decreases the pH level of swimming pool water, but less than does trichlor. Soda ash is the ancillary chemical generally used to raise the pH level. Cal hypo and liquid bleach increase the pH level of pool water. Muriatic acid or hypochloric acid are the ancillary chemicals used most frequently with cal hypo and bleach to adjust the pH level. (Kennedy, Tr. 485-86; Christensen, Tr. 1767; Hughes, Tr. 5209)

71. Cyanuric acid ("CA") which is a principal input material for the production of isos, is also sold as a "stabilizer." (Aston, Tr. 4537-38) It stabilizes the chlorine in the pool water by protecting the chlorine from being degraded and consumed by the sun's ultraviolet rays. Pools using isos need not be stabilized with CA, while pools using cal

hypo or bleach must be. (Kennedy, Tr. 588, 611-12; Schaub, Tr. 2181-82)

72. Products sold in the United States as pool sanitizers include isos, bleach, cal hypo, chlorine gas, lithium hypochlorite, certain bromine compounds, Baquacil, and various mechanical and electrical devices that produce and dispense chlorine or another sanitizing agent. Two principle types of isos are used as pool sanitizers: trichlor and dichlor. All of the above products have the same end use and perform the same [23] function: sanitization of swimming pool water. (Kennedy, Tr. 455-56; Bloom, Tr. 646, 773-74; Pettoruto, Tr. 1348#; Marcum, Tr. 3979-80) Vonderlow, Tr. 4807-08; Hughes, Tr. 5190-91); CX 677-J, Z41, Z42#)

73. Available chlorine ("AvCl") is a measure of the amount of chlorine contained in a product that is available to accomplish sanitization of pool water. Because pool sanitizers differ in the amount of available chlorine they contain, available chlorine provides a common denominator among the various pool sanitizers by which one can measure the relative disinfection potential per unit of different sanitizers in pool water. (Schaub, Tr. 2049-50; Marcum, Tr. 3981-82; Aston, Tr. 4451; Moran, Tr. 5595-96); Kosche, Tr. 8454-55#)

74. Originally, in the 1940's and 1950's, liquid bleach and chlorine gas were the predominant form of pool sanitizer. (Scott, Tr. 5745; Christensen, Tr. 1925) Subsequently, calcium hypochlorite was introduced as an alternative to liquid bleach and chlorine gas. (Christensen, Tr. 1925) Olin commercialized production of cal hypo in 1927 and began selling it shortly thereafter, but it was not until much later that cal hypo's application as a pool sanitizer was discovered. (Turnipseed, Tr. 7462-63) Bay State, a Northeastern distributor, started selling cal hypo as a pool sanitizer in 1955 or 1956 because "[n]ot everybody wanted sodium hypochlorite." (Arakelian, Tr. 5865-67) Cal hypo offered the convenience of having a higher available chlorine content (65 to 70%) and longer shelf life than bleach and an easier and safer method of application than both bleach or chlorine gas. Cal hypo soon achieved a substantial market penetration at the expense of both. (Kennedy, Tr. 599-600; Jonas, Tr. 2218; Christensen, Tr. 1925)

75. In the 1960's, isos were introduced as alternatives to both cal hypo and bleach. Isos offered a number of advantages over both cal hypo and bleach, including (1) a higher available chlorine content; (2) a more convenient form, when compressed in tablets or sticks, for

application than both cal hypo and bleach; and (3) built-in cyanuric acid stabilizer which slowed the release of available chlorine and reduced the frequency of applications needed to sanitize the pool. In the 1960's and 1970's, as a result, isos took sales volume from both cal hypo and bleach. (Christensen, Tr. 1925; Jones, Tr. 2218; Kennedy, Tr. 497-98)

76. Throughout this period, bleach has remained a popular pool sanitizer in certain regional areas, including portions of Florida, southern California, upstate New York and the Detroit-Chicago area. (Castagnoli, Tr. 2443-44) These areas have been "traditionally bleach markets, way back before even [24] calcium hypochlorite was being supplied" and have "remained as such." (Castagnoli, Tr. 2495) Indeed, "[s]ince . . . coming into this thing [*i.e.*, the swimming pool sanitizer business] in 1963, those pockets of sales of liquid bleach haven't changed dramatically They are still selling bleach in south Florida. They sold it 20 years ago, and they will sell it 20 years from now." (Castagnoli, Tr. 2443) Also, there is evidence indicating that, during the past few years, liquid bleach may have been gaining some new ground in some sections of the country. *E.g.*, Roberts, Tr. 5067-68; Moran, Tr. 5569-70#; Scott, Tr. 5795#; Kent, Tr. 6557-58#; RX 43-J; RX 52-S#.

1. Dry Pool Chemicals

a. *Isocyanurates*

77. Isocyanurates are white, crystalline solids with a chlorine content ranging from 56% to 90%. (Kennedy, Tr. 467; Christensen, Tr. 1777; Comm. Phy. Ex. 4-6) Isocyanurates were first introduced for pool sanitization in 1958 and have subsequently become a major swimming pool sanitizer, particularly popular among residential pool owners. (CX 256-J)

78. Most domestic isocyanurate consumption, approximately 70%, is used for sanitizing swimming pools. (CX 548-D) Isocyanurates are also used in a variety of industrial applications. (CX 256-L)

79. Isocyanurates are marketed in two chemical varieties which are generally referred to as "dichlor" and "trichlor." (Kennedy, Tr. 456) Dichlor is a shorthand expression for a family of three chemical compounds more accurately identified as dichloroisocyanurates. The dichlor compounds are also identified by other shortened designations, including "dichloro," "di," "SDCC" and "NaDCC." Dichlor compounds range in chlorine content from 56% to 62%. (CX 256-D, G;

Collins, Tr. 3567; Marcum, Tr. 4135-36#) Trichlor is a shorthand expression for the chemical compound trichloroisocyanuric acid. Trichlor is also referred to as "tri," "trichloro," "TCCA" and "TICA." Trichlor has a chlorine content of 90%. (CX 256-D; Marcum, Tr. 4135#)

80. The principal raw materials used in the manufacture of isocyanurates are chlorine, caustic soda and cyanuric acid ("CA"). Dichlor is produced by chlorinating cyanuric acid with two parts caustic soda to one part cyanuric acid, followed by chlorination to yield dichlor. Trichlor results from the combination of three parts caustic soda with one part cyanuric acid, followed by chlorination. (CX 179-Z14-15; CX 256-E-F) [25]

81. CA is generally produced by first pyrolyzing (*i.e.*, heating) urea in a vessel referred to as a kiln which generates crude CA, and that intermediate product is refined by acid hydrolysis. (CX 179-Z15; Kosche, Tr. 8301) CA is initially produced as a powder. It may also be compacted into granular form in the same production process stream. (CX 179-Z15; CX 256-E)

82. The chlorination process varies among the domestic producers of isos. Olin, for example, manufactures trichlor at its Lake Charles, Louisiana plant by # #. (CX 439#)

83. FMC produced dichlor at its South Charleston, West Virginia plant by chlorinating a slurry of disodium cyanuric acid to form dichloreycyanuric acid, which was then separated and mixed with 50% sodium hydroxide (caustic soda) to form sodium dichloroisocyanurate in slurry form. The slurry was then cooled and separated with the solid dichlor sent to be drummed and dried and the filtrate sent to acidification or waste treatment. (CX 19-B) FMC produced trichlor by chlorinating a trisodium cyanuric acid solution to form TCCA which was then separated and the solids sent through a flash dry and drummed. (CX 19-B)

84. Monsanto first produces # # (Marcum, Tr. 4053-55#; RX 355) Monsanto purchases the chlorine and caustic soda it uses to manufacture isos while Olin and FMC produced their own. (Henske, Tr. 7201#)

85. Nissan of Japan manufactures trichlor # #. (CX 676-Z28-Z34#) Shikoku of Japan manufactures trichlor in a two-stage chlorination process which results in a trichlor slurry that is then filtered and dried. The dichlor process is similar to FMC's and involves reacting dichlor wetcake with caustic soda, [26] centrifuging the reaction, and drying the granular matter. (CX 19-T, U)

86. Trichlor dissolves slowly in water and is generally sold in several sizes. (CX 649-C; CX 687-E; Schaub, Tr. 2029-30; Collins, Tr. 3566-67) Trichlor tablets are fed into the pool through skimmer baskets, floaters and in-line feeders, which allow the water to flow around the tablets, which slowly leach into the water. (Collins, Tr. 3566; Kosche, Tr. 8822-25#) Applied through a feeder, the large trichlor tablets, three (or more) inches in diameter, will thus continuously release chlorine as they dissolve in water over a period of a week (Marcum, Tr. 4139#), while small trichlor tablets are applied as often as once a day. (Schaub, Tr. 2030) Trichlor is often referred to as a long lasting sanitizer. (Schaub, Tr. 2173; Marcum, Tr. 4139#) Trichlor is strongly acidic with a pH of 3.0 in water solution, which must be adjusted to prevent corrosion of pool equipment. (Schaub, Tr. 2063-64, 2178-79)

87. While most domestic trichlor consumption is for sanitizing swimming pools, some trichlor is used in automatic dishwashing detergent, commercial laundry bleach and home laundry bleach. (CX 256-L)

88. Dichlor is generally sold for swimming pool use in granular form and is applied by manually broadcasting the granules into the pool. (Collins, Tr. 3566; Scott, Tr. 5847) Dichlor is a readily soluble chemical which dissolves rapidly in pool water, releasing its chlorine content much faster than trichlor tablets. (Christensen Tr. 1791-92; Schaub, Tr. 2173-74; Collins, Tr. 3566-67) The dichlor pool sanitizer must be reapplied with greater frequency than trichlor. (Marcum, Tr. 4139) Dichlor has a pH of 6.0 upon solution in water and requires comparatively little pH adjustment. (Schaub, Tr. 2064)

89. About half of dichlor consumption is as a swimming pool sanitizer. The other half is used in a variety of industrial applications, most importantly in automatic dishwashing detergents and scouring powders. (CX 179-Z18; CX 267-B#; CX 465-L)

90. Nationally, tablets account for approximately 70-75% of isocyanurate pool sanitizer consumption, with the remainder being granular. (CX 548-D; Kennedy, Tr. 456; Collins, Tr. 3643) However, in some areas of the country, granular isos are as much as 40% of iso sanitizer sales. (Castagnoli, Tr. 2426; Aston, Tr. 4456) In certain parts of the Midwest, the granular iso product is considered more popular than the tablet. (Scott, Tr. 5821) [27]

91. Most recent projections are for iso consumption to grow at a rate of 4-5% per year. (CX 261-D#; CX 451-D#; Marcum, Tr. 3976, 3998-99) Earlier projections for iso growth were in the 8-12% range.

(CX 876-A#) Isos' largest areas of growth are the South, Southwest and West Coast. (CX 291-A#)

b. *Calcium Hypochlorite*

92. Calcium hypochlorite, often referred to as "cal hypo" or "CH," is a white crystalline solid which is marketed for pool use in two chemical varieties, one containing 65% chlorine and one with 70% chlorine. (Pettoruto, Tr. 1408#; Christensen, Tr. 1778, 1780) The 65% and 70% cal hypo products have relatively low levels of impurities and are therefore suitable for use in swimming pool sanitization. (CX 377-H#) Other calcium hypochlorite products are manufactured containing high levels of impurities that make them unsuitable for swimming pool use.

93. Until 1983, Olin produced calcium hypochlorite through the # #. Olin currently uses the # #. (CX 439#) PPG manufactures cal hypo by reacting chlorine, sodium hydroxide and lime. (Hughes, Tr. 5166)

94. Cal hypo will decompose rapidly and release chlorine gas if exposed to high heat. Cal hypo will burn if water is poured into it or if it is contaminated with a large amount of organic material. Cal hypo also tends to intensify a fire and make it more difficult to extinguish. (Kennedy, Tr. 594; Bloom, Tr. 792#; Pettoruto, Tr. 1408-09#; Behnke, Tr. 1603, 1680-82; Aston, Tr. 4559-61; Hughes, Tr. 5323-24#)

95. The majority of cal hypo for pool use is sold in granular form with a smaller portion sold in tablet form or in a feeding device. Most retail dealers sell only granular cal hypo. (Kennedy, Tr. 458, 592-93; Schaub, Tr. 2162; Marshall, Tr. 1189-90; Behnke, Tr. 1607-08; Christensen, Tr. 1788; Tr. 2214; Turnipseed, Tr. 7728-29#; CX 484-W#)

96. Cal hypo can be broadcast into a pool, added to the pool's skimmer, or dissolved in water to form a slurry that is then applied to the pool. Because cal hypo, when broadcast, can [28] leave a residue and stain or bleach a vinyl-lined pool, many manufacturers and dealers recommend that cal hypo be first dissolved in water and the resulting slurry then poured into the pool. (RX 295; CX 724-G; Kennedy, Tr. 456-57, 466-67, 596, 607; Pettoruto, Tr. 1489-90#; Schaub, Tr. 2058, 2183-85; Castagnoli, Tr. 2516-18; Aston, Tr. 4561-63; Hughes, Tr. 5205) Cal hypo can also be introduced to pool water by means of floaters or in-line feeders. (Kennedy, Tr. 458; Kosche, Tr. 8851#, 8858#)

97. Cal hypo tends to contain particles that do not dissolve completely in the pool water. Insolubility can be a particular problem in areas that have hard water. For this reason, cal hypo manufacturers often recommend that it be slurried before being applied to the pool. If not properly applied, the undissolved particles in cal hypo can make pool water cloudy, clog filters, and leave residue on the bottom of the pool that can stain or bleach vinyl liners. (Kennedy, Tr. 607; Pettoruto, Tr. 1497#; Hughes, Tr. 2183)

98. Approximately 85% of the calcium hypochlorite pool sanitizer consumed in the United States is granular, with tablets accounting for 15%. (CX 546-B; CX 548-C) Among residential pool owners, it is estimated that as many as 20% of the calcium hypochlorite users treat their pools with tablets. (CX 4-O)

99. Calcium hypochlorite is used in swimming pool sanitization both as a primary or maintenance sanitizer and as a shock treatment chemical. (CX 257-F-G; CX 286) When used as a primary sanitizer, it must be applied to the pool daily or once every few days if the pool is stabilized with cyanuric acid. (Marcum, Tr. 4139#; Breving, Tr. 6171-72) The brand name or packaging sometimes indicates whether it is marketed as and intended to be used as a shock treatment or as a primary sanitizer. (CX 677-Z138#; Kennedy, Tr. 593-94; Bloom, Tr. 785-86#; Marshall, Tr. 1189-90; Christensen, Tr. 1769-70, 1784, 1928-29, 1931; Castagnoli, Tr. 2430-31, 2510-12; Aston, Tr. 4450-51; Hughes, Tr. 5173-74) Olin markets an HTH brand "Superchlorinator/Shock" product in one-pound bags, but PPG merely recommends adding up to twenty ounces of its Pittchlor brand cal hypo for shocking purposes. (CX 257-L; CX 555-F, G)

100. There is no chemical difference between the cal hypo sold for shock treatment and the cal hypo sold for primary sanitization. (Christensen, Tr. 1769-70, 1777-78; Castagnoli, Tr. 2510-11; Hughes, Tr. 5173-74) When cal hypo is sold or used as a shock treatment, it is a complementary rather than a substitute product to whatever primary swimming pool sanitizer is being used. (Christensen, Tr. 1935; Benson, Tr. 5000; Spiegel, Tr. 6780-81) [29]

101. The rate of growth in demand for calcium hypochlorite has declined. From the early 1970's to the early 1980's, the demand for calcium hypochlorite grew at an annual rate of about 8-9%. (CX 546-A) More recently, forecasts of cal hypo demand growth have been in the 4% per year range. (CX 548-D; Hughes, Tr. 5166) Cal hypo's greatest growth area is the Northeast, although its use is growing in the South and Southwest as well. (CX 291-B#)

c. Bromine-based Pool Chemicals

102. Bromine-based pool sanitizers have been available since the late 1950's. Bromine comes in two forms: a dry form known as "hydantoin" or "BCDMH" that is offered in sticks or tablets; and sodium bromide, which is a two-part system involving liquids. The hydantoin bromine is used to sanitize swimming pools and spas, while sodium bromide is used almost exclusively in spas. Because sodium bromide must be used with another chemical, monopotassium sulphate, and because it is difficult to balance and control, the substantial amounts of the two chemicals required to sanitize a pool, sodium bromide is considered impractical for that use. (Marshall, Tr. 1669; Jonas, Tr. 2234-35)

103. Brominated sanitizers such as BCDMH are much more expensive than isos and cal hypo (CX 100-B; CX 736-B; Marcum, Tr. 4143#; Vonderlow, Tr. 4824; Breving, Tr. 6183; Spiegel, Tr. 6795) and have not been widely used by pool owners. (Bloom, Tr. 719; Marshall, Tr. 1142, 1154, 1166; Christensen, Tr. 1833-34; Russ, Tr. 5694; Spiegel, Tr. 6817-18, 6866) However, BCDMH is widely used in spas and hot tubs because it maintains its sanitizing effect longer than chlorine in hot water (104 to 105 degree) present in spas and hot tubs. (CX 175-Z38; CX 471-Z20#; Schaub, Tr. 2100; Jonas, Tr. 2233-34; Castagnoli, Tr. 2437-38; Marcum, Tr. 4142#; Sossamon, Tr. 4586; Hughes, Tr. 5234#; Scott, Tr. 5790; Kent, Tr. 6497, 6523, 6527) BCDMH is also used in industrial water treatment. (Marshall, Tr. 1176)

104. BCDMH or hydantoin bromine is usually fed to the pool or spa through a "brominator," a device built into the pool's filtration system. BCDMH is sold in a granular, tablet and stick form. (CX 102-E; Kennedy, Tr. 459; Breving, Tr. 6172)

105. Bromine is a much less effective sanitizer of swimming pools than chlorine (CX 10-Z20; Marshall, Tr. 1142-43, 1154-55; Christensen, Tr. 1833; Jonas, Tr. 2232-33, 2236-37) and as much as thirty pounds of bromine may be required every two weeks in order to sanitize a residential pool. (Breving, Tr. 6226-27) BCDMH cannot be stabilized in a residential pool in a cost-effective manner. (Bloom, Tr. 719) BCDMH has also been [30] plagued by technical problems (CX 93-B#), including causing malodors (CX 10-Z20), turning pool water a greenish color (Vonderlow, Tr. 4825), and causing itching and skin irritation to bathers. (CX 89-A#; Jonas, Tr. 2233) Certain provinces in Canada have outlawed the use of brominated sanitizers because such

problems were considered a risk to public health. (CX 41; CX 97; CX 99; Jonas, Tr. 2233)

106. There is currently only one known producer of BCDMH of any significance, the Hydrotech Division of Great Lakes Chemicals Corporation (Kennedy, Tr. 516; Vonderlow, Tr. 4824), with a capacity of # # (CX 87#; CX 102-D; Marshall, Tr. 1174-75, 1220-21#) Patents held by Hydrotech expired in 1981 and 1985 (Marshall, Tr. 1144-45) and, although new competition has been anticipated since 1980, it has yet to materialize. (Marshall, Tr. 1145-47, 1151-52#)

107. Presently, BCDMH accounts for about 4.5 million pounds in sanitizer sales in the United States annually. (CX 2-I, Q; CX 102-F; CX 104-D, L-M, Z12) The evidence indicates that brominated pool sanitizers will remain insignificant for the foreseeable future. (Marshall, Tr. 1153-55#)

d. *Lithium Hypochlorite*

108. Lithium hypochlorite is a crystalline solid containing 35% chlorine (CX 10-Z22; CX 184-E-F#; Bloom, Tr. 718; Schaub, Tr. 2102; Jonas, Tr. 2214, 2223; Kosche, Tr. 8453#), and generally applied to pool water by broadcasting. (Kennedy, Tr. 459; Brevig, Tr. 6188)

109. Lithium hypochlorite contains a relatively low level of insolubles and dissolves well in cold water. (Kennedy, Tr. 459; Christensen, Tr. 1830) It is more expensive than either calcium hypochlorite or isocyanurates. (Christensen, Tr. 1830; Schaub, Tr. 2102; Castagnoli, Tr. 2459; Marcum, Tr. 4141#; Vonderlow, Tr. 4826-27; Benson, Tr. 4919) Olin's George Turnipseed has estimated that, based on chlorine content, lithium hypochlorite is three times as expensive as isos. (CX 471-Z20#) There is also some concern in the swimming pool industry about possible health hazards associated with the use of lithium hypochlorite as a pool sanitizer (CX 10-Z22; Christensen, Tr. 1834-35; Schaub, Tr. 2102)

110. Lithium hypochlorite has a limited use as a pool sanitizer. (Schaub, Tr. 2100; Vonderlow, Tr. 4770) It is not generally available in significant quantities on a reliable basis. (Christensen, Tr. 1835; Schaub, Tr. 2100; Jonas, Tr. 2223-24) There is only one known producer of lithium hypochlorite, Lithium Corporation of America, with a capacity of [31] about # # pounds. (CX 184-C#; CX 414; Bloom, Tr. 718; Jonas, Tr. 2224; Castagnoli, Tr. 2435; Sossamon, Tr. 4616)

111. Lithium hypochlorite's use as pool chemicals is insignificant compared to the overall consumption of swimming pool sanitizers. (CX 412#; CX 686-C#; Bloom 627) Witnesses testifying at trial suggested it accounts for 1-3% of total sanitizer usage. (Schaub, Tr. 2100; Vonderlow, Tr. 4770) Presently, lithium hypochlorite accounts for less than # # pounds of sanitizer sales in the United States annually. (CX 184-D#) The suppliers who distribute lithium hypochlorite as a pool sanitizer generally market the product for shock treatment. (CX 414; Marshall, Tr. 1132; Jonas, Tr. 2223; Castagnoli, Tr. 2459) Lithium hypochlorite is also sold as laundry bleach and toilet bowl cleaner. (CX 184-D#)

2. Liquid Pool Chemicals

a. *Sodium Hypochlorite or Bleach*

112. Sodium hypochlorite is a liquid which is sold for swimming pool use with approximately 10-12% chlorine content. (Kennedy, Tr. 461-62; Castagnoli, Tr. 2503; Smith, Tr. 6668) It is generally applied by pouring it into the pool or a bleach feeder can be used. (RX 367; RX 368-C; RX 368-B)

113. Sodium hypochlorite or bleach is manufactured by reacting caustic soda with chlorine. It can be made in either a batch process, by mixing a predetermined quantity of bleach at one time, or a continuous process, by continuously reacting a flow of ingredients. The continuous process has lower labor cost and larger output than the batch process. (Smith, Tr. 6660-61; Wilson, Tr. 4293)

114. Bleach may be used as either a primary sanitizer or a shock treatment. (Kennedy, Tr. 460-61, 597; Marshall, Tr. 1222; Castagnoli, Tr. 2496-97) Bleach used as a shock treatment is chemically the same as bleach sold or used as a primary sanitizer. (Moran, Tr. 5560-61#)

115. Bleach is a less expensive product than isos or cal hypo (Breving, Tr. 6175) and is said to be popular among less affluent owners where it is available. However, it is a relatively inconvenient product to use as a swimming pool sanitizer because of its bulk, weight, liquid form and instability. (Pettoruto, Tr. 1349#; Behnke, Tr. 1600; Schaub, Tr. 2046; Wilson, Tr. 4338-39; Vonderlow, Tr. 4861-63; Hammersmith, Tr. 6109-12) [32]

116. Sodium hypochlorite is chemically unstable and loses its chlorine content rapidly, even in the best of circumstances, and the rate of decay is accelerated in warm weather. (Kennedy, Tr. 461; Behnke, Tr. 1602; Christensen, Tr. 1783; Castagnoli, Tr. 2508;

Wilson, Tr. 4378-79) Sodium hypochlorite also has a strong adverse effect on water pH. (CX 10-Z59; Schaub, Tr. 2046)

117. Liquid bleach is also used in home and commercial laundry applications, and industrial applications, such as waste water treatment. Bleach used for home laundry generally has about 5% chlorine. The machinery used to manufacture household bleach cannot be used to make pool bleach. (Wilson, Tr. 4385-86, 4504; Castagnoli, Tr. 2505) Commercial bleach, like that sold to commercial laundries, has the same level of available chlorine as bleach sold for swimming pool sanitization end-use, that is, it is labeled at 12%, but it is produced at approximately 14 to 16%. (Castagnoli, Tr. 2503-04)

118. Pool bleach is not used or sold in many areas of the country. Its use has been limited to certain "pockets" or regions. (Castagnoli, Tr. 2443) In those regions where it is popular, it is generally sold in gallon jugs, "4x1s" (four one-gallon containers sold together in a carrying case) or in "carboys" (two-and-one-half or five gallon containers).

119. A number of respondent's witnesses, who appeared to be bleach-enthusiasts, testified that sales of pool bleach have been increasing in many areas, including certain sections of the country where it had not been available or popular. *See* RPF 630. However, the distribution of pool bleach is generally limited to an area within a 250-to-300-mile radius of a pool bleach plant because of its bulk, weight and high transportation cost and low unit value. *See* F. 285-89, *infra*. The record as a whole indicates that at the present time pool bleach plants are to be found in or near those pockets or regions where pool bleach has traditionally been a factor in residential pools, such as portions of southern Florida, southern California and the Detroit metropolitan area.

b. *Baquacil*

120. "Baquacil" is the brand name of a liquid pool sanitizer produced by Imperial Chemical Industries Plc. in the United Kingdom and is marketed by ICI America in the United States. ICI America describes it as an alternative to chlorinated sanitizers which can be used to sanitize a pool in lieu of isos, cal hypo or liquid bleach. Baquacil is a liquid, non-chlorine-bearing sanitizer that is marketed in a three-part [33] system, involving the use of Baquacil in conjunction with two other liquid products. (CX 532-B; Jonas, Tr. 2235-36)

121. Baquacil is not compatible with chlorine systems (Pettoruto, Tr. 1350-51; Spiegel, Tr. 6820) and can cause stains on plaster or

concrete pools and problems with the filtration system. (Bloom, Tr. 725-26#; Pettoruto, Tr. 1350#; Spiegel, Tr. 6820) The operating cost for the residential pool owner using the Baquacil system is about twice that of comparable chlorine sanitizers. (CX 532-F; Spiegel, Tr. 6820)

122. Baquacil is available in limited areas in this country (CX 128-C#) and is largely unheard of by sellers of pool chemicals. (Christensen, Tr. 1836; Roberts, Tr. 5095; Scott, Tr. 5843) Those who are familiar with Baquacil do not consider it to be a viable product. (CX 532-D; Kennedy, Tr. 497; Jonas, Tr. 2235-36; Castagnoli, Tr. 2439)

123. Initial marketing efforts # # (CX 128-B#) Sales of Baquacil are in the # # million range and is insignificant. (Bloom, Tr. 723#)

3. Chlorine Gas

124. Chlorine gas is almost 100% chlorine, comes in pressurized cylinders and is used to sanitize commercial pools. The gas is fed into the pool by using relatively expensive, specialized metering equipment. (Kennedy, Tr. 464; Pettoruto, Tr. 1540#; Christensen, Tr. 1836-37; Kosche, Tr. 8454#) Chlorine gas is highly toxic and dangerous and its use required a skilled licensed operator. (Kennedy, Tr. 464; Christensen, Tr. 1837; Jonas, Tr. 2240; Wilson, Tr. 4380) It is also difficult to store and to transport long distances. (CX 255-A)

125. The use of chlorine gas as a pool sanitizer is limited almost exclusively to large, older commercial pools, and its use has been declining for many years. (CX 128-B#; CX 177-P; Kennedy, Tr. 501; Christensen, Tr. 1836-38; Jonas, Tr. 2240; Aston, Tr. 4505-06; Breving, Tr. 6224) Because of the toxic and corrosive properties of chlorine gas and the need to employ sophisticated metering equipment, chlorine gas is impractical and dangerous for use by residential pool owners. (CX 10-Z57-58; Kennedy, Tr. 463; Christensen, Tr. 1836-38) Consequently, chlorine gas is virtually never used as a pool sanitizer in residential pools. (CX 471-Z21#; Kennedy, Tr. 501; Pettoruto, Tr. 1540#; Christensen, Tr. 1840; Jonas, Tr. 2239-40; Marcum, Tr. 4142#; Smith, Tr. 6721-22) In the few instances in which gas is used to sanitize residential pools, it is applied by licensed, [34] pool service personnel. (Pettoruto, Tr. 1540#; Christensen, Tr. 1839-40; Marcum, Tr. 4142#)

4. Mechanical Pool Sanitizers

126. Chlorine generators, also called salt chlorinators and electrolytic converters, are pool sanitizing devices that use electricity to

derive chlorine from concentrated salt water. (Christensen, Tr. 1841-42; Jonas, Tr. 2238)

127. Chlorine generators retail anywhere from \$600-\$1800 (CX 82; CX 545-E; Christensen, Tr. 1842-43; Jonas, Tr. 2239; Vonderlow, Tr. 4827), and generally entail high electrical operating costs. (CX 10-Z21; Christensen, Tr. 1844) The active parts of these mechanical devices frequently corrode, requiring maintenance or replacement. (CX 10-Z20-Z21; CX 545-E; Christensen, Tr. 1842-43; Spiegel, Tr. 6821) Repair costs tend to be substantial. (CX 545-E; Christensen, Tr. 1843; Vonderlow, Tr. 4828; Russ, Tr. 5714-16) Chlorine generators also pose safety hazards such as chlorine gas leaks and hydrogen gas explosions. (CX 10-Z21)

128. Chlorine generators have been on the market for decades (CX 56-A-B; Christensen, Tr. 1842; Scott, Tr. 5841-42) and numerous companies have tried unsuccessfully to market them over the years. (Christensen, Tr. 1843-44; Russ, Tr. 5707-08; Scott, Tr. 5841-42) They are sold by professional pool dealers and pool builders, who build the pools and install and service chlorinators. (Vonderlow, Tr. 4807, 4827-30; Russ, Tr. 5656-57) A negligible number of swimming pools in the United States are sanitized with chlorine generators. (Jonas, Tr. 2239; Kent, Tr. 6620)

129. Ozonators are machines that sanitize pool water by generating ozone and have been on the market for several years. (Christensen, Tr. 1840; Kent, Tr. 6617) At retail, ozonators are priced in the \$1,500-\$3,000 range. (Jonas, Tr. 2238) A major drawback of ozonators is that they leave no detectable sanitizer residue in pool water, making it difficult to test whether the pool water is in fact in sanitary condition. (CX 415; Christensen, Tr. 1840-41) A second drawback is that, unless regularly and properly maintained, ozonators develop corrosion deposits which prevent them from operating properly. (Christensen, Tr. 1841) Ozonators also require use of ultraviolet lamps which are costly to replace. (CX 415)

130. Ozonators are used primarily in large, commercial pools and in conjunction with a chlorine sanitizer. (CX 415; Christensen, Tr. 1840-41; Jonas, Tr. 2237) [35]

B. Pool Chemicals Consumers

131. Users and consumers of pool chemicals are residential pool owners, commercial pool operators and pool service companies. (CX 259-I#; CX 264-D#; CX 267-C#; Kosche, Tr. 8786-87#)

1. Residential Pool Owners

132. At the end of 1984, there were about 3.9 million residential pools in the United States. (CX 4-C; CX 233-B) The majority of retail sales dollars spent on pool sanitizers are accounted for by residential pool owners. (Kosche, Tr. 8895#)

133. Residential pool owners are the focus of Olin's advertising, promotion and sales efforts for its HTH and PACE brand pool sanitizers. (Kosche, Tr. 8786, 8788, 8790#) And most of Olin's market studies have focused on the residential pool owner. (CX 276-W-Z3; CX 295#; Kosche, Tr. 8788-89#)

134. Other pool chemical producers compile and use market information about residential pools, residential pool owners and their pool chemicals usage. *E.g.*, CX 4-L-T; CX 53; CX 664-Z4; Christensen, Tr. 1889.

135. Residential pool owners who maintain their own pools are sometimes referred to as "do-it-yourselfers" or "self-maintainers." (Kosche, Tr. 8790#) Nationally, 90% or more of residential pool owners are self-maintainers. (CX 4-N; Kosche, Tr. 8790#) Aside from a few areas of the country where use of pool service is relatively popular, most of residential pool owners in this country maintain their own pools. (CX 288)

136. In studying pool sanitizer usage trends among residential pool owners, Olin # # (CX 284-E#); Kosche, Tr. 8640, 8791#) # # (Kosche, Tr. 8794#)

137. Since 1977 Olin annually has purchased residential pool owner primary usage data from a firm known as National Family Opinion ("NFO"). (CX 284-E#) # # (CX 259-I#; CX 276-I, T; CX 278-D#; CX 280-A-B#; CX 281-A#; CX 282-C#; CX 283-E#; CX 284-E#; CX 476-Z23#; CX 647#; Kosche, Tr. 8792-95, 8797-99#) Many industry participants [36] estimate pool sanitizer market shares in terms of the percent of pools treated with the sanitizer. (CX 4-M; Kennedy, Tr. 478; Pettoruto, Tr. 1540#; Scott, Tr. 5789-90, 5845-46)

138. The evidence shows that the self-maintainer's initial selection of pool chemicals is largely influenced by the recommendation of pool builder-installers or professional pool store dealers, who initiate the residential self-maintainer into the somewhat technical and arcane realm of pool maintenance and pool chemicals. (Castagnoli, Tr. 2513; Scott, Tr. 5798)

139. The evidence also strongly indicates that residential owners look for ease, simplicity and convenience of use in choosing pool

chemicals and that the price is usually not the primary consideration. (CX 276-Z1; CX 295-S#; Bloom, Tr. 661; Sossamon, Tr. 4647#; Hughes, Tr. 5052; Kosche, Tr. 8807-09#)

2. Commercial Pool Operators

140. Commercial pools range from municipal and community pools to pools operated by hotels and motels, apartment buildings and condominiums, clubs, schools, YMCA's and other institutions. (CX 430#; Christensen, Tr. 1880; Wilson, Tr. 4292; Breving, Tr. 6203) These pools are generally much larger than residential pools, containing 100,000 gallons or more of water, compared to an average of 20,000 to 30,000 gallons of water in residential pools. (Marcum, Tr. 3983) Operators of these pools are price sensitive in the purchase of supplies for their pools. (CX 259-I#)

141. At the end of 1984, there were about 400,000-500,000 commercial pools in the United States (CX 4-C; CX 430-A#; Bloom, Tr. 635) and about # # of them were located in the Pacific Southwest. (CX 430-O#)

142. Commercial pools are treated as a separate market in Olin planning documents (CX 255-A; CX 259-K#; CX 267-C#; CX 271-Q#) and Monsanto market research also looks at commercial pools separately from residential pools. (CX 4-L-T, U-Z3; Christensen, Tr. 1889)

3. Pool Service Companies

143. Pool service companies provide periodic (usually weekly or more) pool maintenance service to pool owners. Their service ranges from opening a pool at the beginning of the season (*i.e.*, add 20 to 25 gallons of bleach to pool water to kill off any bacteria, algae, etc. and make the pool "swimmable" (Roberts, Tr. 5090), providing weekly sanitization of the pool, performing repairs, vacuuming the pool, and closing the pool at the end of [37] the season. (Hammersmith, Tr. 6024-25; Breving, Tr. 6200; Smith, Tr. 6648)

144. Pool service companies are highly price sensitive with respect to the cost of supplies they use (CX 259-I#) and tend to use bleach where it is available, because it is the least expensive pool chemical. (CX 267-C#; Scott, Tr. 5830; Kosche, Tr. 8879#)

145. The average cost of the basic pool service in Westchester County, New York, and in southern California is \$40-\$42 a week. (Sossamon, Tr. 4728; Breving, Tr. 6191) Such service is generally

once a week and often must be supplemented by the addition of pool chemicals by the pool owner between visits by the serviceman. (Arakelian, Tr. 5982) The cost of these additional chemicals is not included in the regular service fee. (Sossamon, Tr. 4728) Full service requiring several trips a week by the serviceman would cost considerably more. (Sossamon, Tr. 4728-30; Roberts, Tr. 5138-39) The cost of basic pool service is over twice what a self-maintainer would spend to maintain his own pool with dry chemicals. (Sossamon, Tr. 4730)

146. It appears that those areas where pool service is relatively popular largely coincide with those areas where bleach has been a popular pool chemical.

147. The use of pool service companies is most prevalent in southern California, south Florida and metropolitan Detroit. (Bloom, Tr. 635-36; Marshall, Tr. 1134; Kent, Tr. 6529; Kosche, Tr. 8879#) In southern California, pool service is used by as many as 20-30% of residential pool owners. (CX 288; Kosche, Tr. 8790) Aside from these three areas, the proportion of residential pool owners using pool service is about 2-4%. (CX 288) On a national basis, it is about 7-10%. (CX 4-N; CX 284-Z18#; CX 288; Kosche, Tr. 8790#)

148. Most of the pools in south Florida that are sanitized with bleach are treated by pool service companies. (Kent, Tr. 6608) A Florida distributor who testified for Olin sells all his bleach to pool service companies. (Kent, Tr. 6599) A large percentage of bleach consumed on the West Coast is used by pool service companies. (Bloom, Tr. 647) A California bleach producer, Hasa, Inc., estimated that 40% of his bleach sales are to pool service companies. (Wilson, Tr. 4291)

149. An Olin marketing plan estimated that # # of the pool service companies in southern California used bleach and that # # of all bleach in southern California was consumed by pool service companies. (CX 486-F#) The owner of Steelcrete, a bleach distributor in Detroit, testified that most of his top [38] twenty bleach accounts are engaged in pool service operations that may consume 35-40% of the bleach they buy from Steelcrete. (Scott, Tr. 5831)

150. Olin's internal documents categorize pool service as a separate sanitizer market from residential self-maintainers. *E.g.*, CX 267-C#.

C. Marketing and Distribution of Pool Chemicals

151. In the pool chemicals industry the term "dry" sanitizers refers

to calcium hypochlorite and isocyanurate pool sanitizers. (CX 264-D#; Kennedy, Tr. 447, 528; Pettoruto, Tr. 1322; Christensen, Tr. 1827-28; Hughes, Tr. 5264#; Henske, Tr. 7168#; Kosche, Tr. 8642-43#)

152. Pool chemicals are marketed through several distribution channels. Producers can sell the product in bulk form to repackers, or in consumer-sized packaging under their own brand label to distributors or retailers, or in consumer-sized packaging to distributors or retailers under the latter's private brand labels. (Christensen, Tr. 1796; Vonderlow, Tr. 4786-89; Ishida, Tr. 921-22, 972#; Hughes, Tr. 5170-72) Trading companies and import merchants may also be involved in the marketing of imported pool chemicals. (CX 676-Z71, Z72, Z137 to Z139#; Ishida, Tr. 918; Pettoruto, Tr. 1311-12, 1330)

1. Isos and Cal Hypo

a. *Producers*

153. At the time of the acquisition, there were four domestic producers of dry sanitizers. (CX 264-D#; Christensen, Tr. 1796) PPG Industries, Inc. and Olin produced cal hypo. (Kennedy, Tr. 502; Christensen, Tr. 1796) FMC, Monsanto and Olin produced isos. (Kennedy, Tr. 513; Christensen, Tr. 1796) Dry sanitizers were also imported, primarily from Japan through Japanese trading companies. (CX 176-Z11; CX 179-Z21-23, Z55-56; CX 471-Z7#)

154. Olin and FMC packaged much of their own production under their own brand names for sale to distributors, mass merchandisers or, in some cases, larger pool dealers. (CX 179-Z20-21; CX 259-M, Q#; Castagnoli, Tr. 2486; Collins, Tr. 3572; Wilson, Tr. 4272; Hughes, Tr. 5171)

155. Olin's HTH brand cal hypo and PACE brand iso are sold to consumers through all types of retail outlets, while FMC's SUN brand of isos was sold to consumers primarily through [39] pool dealers. (CX 127-I#; CX 177-S; CX 545-D; CX 880-O-P#; Wilson, Tr. 4272) HTH, PACE and SUN, now all owned by Olin, are the most significant brands of dry sanitizers. (Marshall, Tr. 1156; Schaub, Tr. 2114; Jonas, Tr. 2260-61; Castagnoli, Tr. 2454-55; Hughes, Tr. 5353#; Henske, Tr. 7167, 7169#) HTH dominates the cal hypo segment, with HTH sales constituting over # # of cal hypo pool sanitizer sales. (CX 647-B#)

156. FMC's (now Olin's) SUN brand had and now has the largest share of any brand of the isos market. (CX 4-Q; CX 5-B) Olin's PACE

brand has the second largest share of any brand of isos. (CX 4-Q; CX 5-B)

157. The third U.S. manufacturer, Monsanto, sold its iso production exclusively in bulk to repackers. (CX 179-Z20; CX 256-K; Marcum, Tr. 3961-62)

158. The fourth U.S. producer, PPG, followed a "private label" strategy of packaging its product for sale to large distributors in consumer packaging bearing the distributors' respective proprietary brand labels. (CX 259-M#; CX 549-A; CX 677-Z160#; Christensen, Tr. 1890-91; Hughes, Tr. 5301#) PPG also sold small quantities of its own brand of cal hypo under the PITTCLOR label. (Hughes, Tr. 5170-73)

159. Dry sanitizers imported into the United States were sold in bulk to repackers, generally through trading companies and/or importers. (CX 677-Z15-17#; Ishida, Tr. 931; Pettoruto, Tr. 1376, 1521-24#)

b. *Repackers*

160. Repackers buy pool chemicals in bulk form (100-400 pound drums) and package them into consumer-sized packaging (1-100 pounds) under their own label or the private label of a distributor or retailer (Kennedy, Tr. 448-49; Bloom, Tr. 634; Pettoruto, Tr. 1335-36#; Christensen, Tr. 1796) Repackers buy from domestic producers or from trading companies or import houses. Many repackers also reformulate pool chemicals into tablets or sticks before packaging. (Kennedy, Tr. 448-49; Collin, Tr. 3569) Some repackers also perform contract packaging and tabletizing for producers. (CX 179-Z29)

161. Repackers sell pool chemicals to both levels of distribution below them, *i.e.*, distributors and retailers. Some repackers also operate their own retail stores. (CX 179-Z29) Repackers generally sell in regional marketing territories. Not even the largest of the repackers, such as Bio-Lab, E-Z Clor, Alden Leeds, Georgia Pacific, and Hydrotech, have a national distribution system. (Christensen, Tr. 1785, 1891) Compared [40] with the national brands SUN, PACE and HTH, repackers generally have relatively limited advertising and promotional programs. (Castagnoli, Tr. 2534) Repacker brands compete with the national brands by offering lower prices. (Scott, Tr. 5849; Kent, Tr. 6586-87, 6594#; Henske, Tr. 7128#)

162. During the late 1970's, there were over forty independent repackers in the United States. (CX 54-A; Marshall, Tr. 1124) A 1985

document prepared by one major repacker places the number of independent repackers at thirty-two. (CX 5-B) Some repackers believe that there are now no more than twenty repacker operations still in business. (Christensen, Tr. 1795-96; Schaub, Tr. 2110; Jonas, Tr. 2219-20)

c. Distributors and Retailers

163. Distributors are wholesalers who buy pool chemicals in consumer-sizes from producers or repackers, and sell to retail dealers. (Schaub, Tr. 2020; Sossamon, Tr. 4589; Vonderlow, Tr. 4768; Hughes, Tr. 5170; Kent, Tr. 6525) There are approximately 500 to 700 distributors in the United States. (CX 176-W)

164. Retailers are divided between pool dealers or "pool pros," who specialize in retail sales of a range of pool-related products and services to residential pool owners, and non-specialists, which include mass merchandisers, lawn, garden and building supply outlets and other retail outlets. (Schaub, Tr. 2020; Vonderlow, Tr. 4806; Hughes, Tr. 5170-71; Hammersmith, Tr. 6022; Smith, Tr. 6647#)

165. Mass merchandisers, also referred to in the pool industry as "the masses" or "the chains," generally provide little or no customer service to the residential pool owner. (Behnke, Tr. 1594) Olin estimates that approximately # # of all isos sales and # # of all cal hypo sales are made through mass merchandisers. (CX 310-A#) It is estimated that there are more than 17,000 retail outlets which sell pool chemicals in the United States. (CX 176-W)

2. Bleach

166. Liquid bleach is generally produced and sold within a two to three hundred mile radius of the bleach plant. (Schaub, Tr. 2110; Wilson, Tr. 4303; Marcum, Tr. 4134-35#; Benson, Tr. 4959; Scott, Tr. 5765, 5802-03; Hammersmith, Tr. 6029-30, 6089) In some instances, bleach may be shipped as far as 400 to 425 miles when other dry pool chemicals are being shipped on the same run. (Christensen, Tr. 1853-59) It may be sold directly to distributors, retailers or consumers either under the producer's label or the private label of the distributor or retailer. [41] (Spiegel, Tr. 6858-59; Roberts, Tr. 5080-81; Kent, Tr. 6532-33) In any event, it is not possible to get nationwide distribution out of any one bleach plant. (Turnipseed, Tr. 1858-59)

IV. THE RELEVANT PRODUCT MARKETS

A. *Introduction*

167. The complaint alleges, and the parties agree, that isos constitute a relevant product market in this case. (Complaint ¶ 13(b). See CPF 386-410; CB at 18-20; RPF 665-703; RB at 46-67). However, the parties sharply disagree as to whether isos and cal hypo together, the leading dry pool chemicals, also constitute a valid antitrust market for the purposes of this case. The record as a whole clearly and convincingly demonstrates that (1) isos and cal hypo together constitute a valid antitrust market in this case; (2) isos alone also constitutes an economically significant product market; and (3) bleach does not belong to the same product market with cal hypo and/or isos for the purposes of this proceeding.

168. To paraphrase *Brown Shoe*, a determination of the relevant market is a necessary predicate to a finding of liability under Section 7 because the threatened substantial lessening of competition or tendency to create a monopoly must be within the area of effective competition. *Brown Shoe Co. v. United States*, 370 U.S. 294, 324 (1962) (quoting *United States v. E.I. du Pont de Nemours & Co.*, 353 U.S. 586, 593).

169. *Brown Shoe* further made clear that the *outer* boundaries of a product market are determined by the reasonable interchangeability of use or the cross-elasticity of demand between the product and its practical substitutes and further that the product market boundaries must be drawn with sufficient breadth to recognize competition where it in fact exists. *Brown Shoe*, 370 U.S. at 325-26.

170. As a guide to these analyses, *Brown Shoe* pointed to a number of “practical indicia,” including industry or public recognition as a separate economic activity, the product’s peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes and specialized vendors. *Brown Shoe*, 370 U.S. at 321. These indicia, however, are not to be applied in mechanical fashion, but are to be used to define product markets that are economically significant in terms of the alleged anticompetitive effect. *E.g., IT&T Corp. v. GT&E Corp.*, 518 F.2d 913, 932 (9th Cir. 1975). [42]

171. In applying these principles to define a relevant product market in which the effects of a given merger is to be evaluated under Section 7, the 1984 *Department of Justice Merger Guidelines* (“DOJ

Guidelines”), Trade Reg. Rep. (CCH) No. 655 (June 14, 1984), seek to determine whether a hypothetical monopolist could profitably increase price by a “small but significant and nontransitory” amount without inducing enough buyers to shift to substitute products outside the postulated market so as to render such an attempt to increase price unprofitable. If such a price increase would result in substantial shifting, the DOJ would add the next-best substitute to the product market and ask the same question with respect to the broader market. The smallest group of products which would permit such a profitable price increase will constitute an appropriate relevant product market. See *DOJ Guidelines* § 2.11.

172. Industrial organization economists approach the question of product market definition from the standpoint of cross-elasticity of demand or supply (Kamerschen, Tr. 2660), which is defined as the percentage change in the quantity of one product over the percentage change in the price of another product. (Kamerschen, Tr. 2676; Ordover, Tr. 9411, F. Scherer, *Industrial Market Structure and Economic Performance* (2d ed. 1980) at 61 n. 57.)

173. To be sure, “cross-elasticity of supply and demand” is an attractive concept in defining an “economic market.” It has the virtue of conceptual clarity and enables a rational delineation of markets within the framework of equilibrium price theory. However, the “real world” has seldom, if ever, been as accommodating as one might wish in terms of providing precise or reliable price-quantity data of sufficient scope or depth to enable us to define with any degree of precision an economic market with respect to any product or a group of products. See, e.g., Scherer, *supra*, at 60; Glassman, *Market Definition As A Practical Matter*, 49 Antitrust J. 1155, 1156, 1161-65 (1981); Kamerschen, Tr. 2676. Although references to cross-elasticity abound in product market discussions in judicial decisions and antitrust law literature since *Brown Shoe*, we have yet to see a reported decision in which the court determined the appropriate product market based on a rigorous application of the cross-elasticity test.

174. Be that as it may, inasmuch as the purpose of the cross-elasticity analysis is to see whether consumers in the marketplace regard functional substitute products as realistically close-enough substitutes to require that they be placed in the same product market, limited or less than perfect data could be used as a surrogate to see if the available data [43] suggest that the products under discussion are

in fact close-enough substitutes and belong to the same product market.

175. In an attempt to apply these concepts to product market definition, the *DOJ Guidelines* suggest that a hypothetical price increase of 5% be used as a general benchmark, although the 5% test is not to be applied inflexibly and much smaller or much larger increases may be postulated depending upon the trade realities of each case. *DOJ Guidelines* § 2.1; Statement Accompanying Release of Revised Merger Guidelines (June 14, 1984) at S-14 (BNA, June 15, 1984). Thus, the *DOJ Guidelines* acknowledge that "it will usually be necessary for the Department to infer the likely effects of a price increase from various types of reliable, circumstantial evidence," including evidence of buyer and seller perceptions, movements in prices, and technical product characteristics. *DOJ Guidelines* § 2.12. Economists also recognize the importance of such common-sense devices as looking for a "qualitative gap in the chain of substitutes." (Kamerschen, Tr. 2662; Scherer, *op. cit.*, at 60) Such information may be useful, in conjunction with other confirmatory information about the products, in determining the appropriate product market in this case.

176. The FTC's approach in defining a product market in horizontal merger cases is similar. The central inquiry is whether different products serving the same end use compete significantly with each other. If a high cross-elasticity of demand or reasonable interchangeability of use exists as a practical matter, the products belong to a single antitrust market. Where such competition exists, the products will significantly constrain each other's prices, output, product quality, marketing and other business decisions. *See* Statement of the Federal Trade Commission Concerning Horizontal Mergers, Trade Reg. Rep. (CCH) No. 546 (June 14, 1982) ("FTC Statement") at 12.

177. In defining the relevant product market for the purposes of this case, we shall examine "the various types of reliable, circumstantial evidence," including the evidence of product substitutability, perceptions of buyers and sellers and technical product characteristics insofar as reliable quantitative evidence of sufficient scope regarding the likely effect of a "small but significant and nontransitory" price increase upon buyers, is not available.

178. It is also important to keep uppermost in our mind throughout the discussion of product market in this case that our task is to determine an antitrust market for this acquisition and that that

market may or may not coincide with an economic market for pool chemicals. Cf. Scheffman and Spiller, Geographic Market [44] Definition Under the DOJ Guidelines, Working Paper No. 129, FTC Bureau of Economics (August, 1985), at 2-6.

179. To put it another way, our central inquiry is whether the acquisition is likely to lead to the exercise of market power by Olin or by some larger group of pool chemicals producers. Therefore, the definition of a relevant antitrust market requires the determination of the smallest relevant group of producers that can attain or possess market power, with the parties to the acquisition as the focus.

180. Therefore, our inquiry will start with the pool chemicals produced and sold by the parties to this acquisition, namely, isos and cal hypo. And, if the preponderance of credible evidence in the record shows that the acquisition may bestow market power upon Olin, or a small group of producers which includes Olin, in the market consisting of isos and cal hypo, then complaint counsel will have discharged their burden of establishing that isos and cal hypo constitute a valid antitrust market in this case even though there may be some evidence arguably suggesting that an economic market in academic sense might be broader.

*B. Isos and Cal Hypo, the Two Leading Dry Pool Chemicals,
Constitute a Valid Antitrust Market in this Case*

1. Product Characteristics and Uses

181. Isos and cal hypo are dry pool chemicals. And they are both marketed in granular form. (CX 649-A-B; CX 650-C) The predominant form in which cal hypo is sold and used as a pool sanitizer is granular. (Schaub, Tr. 2162; Hughes, Tr. 5167, 5256#) Both dichlor and, to a limited extent, trichlor are sold as granular products. (Castagnoli, Tr. 2426; Hughes, Tr. 5167) Cal hypo and isocyanurates are also sold in agglomerated form, primarily as large tablets or sticks, although cal hypo tablets are relatively new. (Schaub, Tr. 2035; Hughes, Tr. 5256#; Wetzels, Tr. 5457; Smith, Tr. 6713#; Kosche, Tr. 8807#)

182. Both cal hypo and isocyanurates in their granular forms are applied to swimming pools in the same manner: they are usually broadcast directly to pool water. (CX 484-W#; Kosche, Tr. 8826-27#) Some cal hypo package label instructions recommend that the product be premixed in a container of water before being applied to pool water. (Schaub, Tr. 2058) Premixing is intended to minimize cal hypo

residue in the pool water. (Schaub, Tr. 2184) However, such residue is considered relatively [45] insignificant (Smith, Tr. 6721#), and users of cal hypo seldom follow the premixing instructions. (Schaub, Tr. 2058)

183. Cal hypo tablets and iso tablets are both applied to pool water by means of feeding devices. (Wetzel, Tr. 5458; Smith, Tr. 6713#; Kosche, Tr. 8822, 8831#)

184. Both cal hypo and isocyanurates have a high chlorine content and can provide relatively long-lasting chlorination. (CX 304-B; Wetzel, Tr. 5453; Smith, Tr. 6718-20#; Kosche, Tr. 8845-48#) Isos and cal hypo are both strong oxidizing agents. (Castagnoli, Tr. 2521-22)

185. Both isos and cal hypo are relatively stable chemicals (Kennedy, Tr. 458-59) that, under proper storage conditions, can maintain their potency throughout a pool season and into the next. (Marcum, Tr. 4133-34#)

186. Because both isos and cal hypo are solids and highly concentrated, stable chemicals, residential pool owners are able, with relative ease and convenience, to purchase, transport and store sufficient quantities of either product to treat their pools over long periods of time. (Christensen, Tr. 1787, 1829; Smith, Tr. 6717-18#) A pool owner can buy and take home a full year's supply of either cal hypo or isos by a family car in a single trip and store it in the corner of the garage or utility shed. (Bloom, Tr. 660; Wetzel, Tr. 5461-62)

187. Isos and cal hypo are similar in terms of ease of operation and relative cost. (Jonas, Tr. 2220) A pool dealer testifying for respondent stated he would recommend isos to customers who have problems with cal hypo and cal hypo to customers who have problems with isos. (Wetzel, Tr. 5462-63)

188. Isos and cal hypo are both shipped and sold nationwide. (Jonas, Tr. 2258; Marcum, Tr. 4135#) They are widely available in all regions of the country, including hard water areas. (CX 471-Z3#; Christensen, Tr. 1826-27)

189. Many witnesses summarized the reasons for the popularity of isos and cal hypo as a convenience advantage over other pool sanitizers. *E.g.*, Kennedy, Tr. 480-81; Bloom, Tr. 661-62; Behnke, Tr. 1618-19; Christensen, Tr. 1829; Schaub, Tr. 2066; Hughes, Tr. 5290-91#. The evidence is clear that, apart from product efficacy, convenience of use is the most important product characteristic to a self-maintainer. Consumers who are use to the convenience of a dry

sanitizer are likely to choose another dry product when considering switching. (Christensen, Tr. 1827-28; Hughes, Tr. 5290-91#) [46]

190. Olin consumer surveys show that, while consumers favored a dry sanitizer over a liquid product for convenience, few consumers were aware of the differences between isos and cal hypo. (CX 454-P, T#)

191. Although there are some significant variances in the degree of convenience between isos and cal hypo (*see* F. 269-73, *infra*), convenience of use is a qualitative factor which can be used in defining an antitrust market. The common characteristics of isos and cal hypo reviewed herein above clearly make the two dry pool chemicals the more convenient sanitizer for the average residential pool owner to use, and this is a qualitative factor important to consumers and which supports inclusion of isos and cal hypo in the same product market in this case. (Kamerschen, Tr. 2663-67, 2961-63)

2. Product Pricing and Price Sensitivity

192. The evidence shows that iso prices and cal hypo prices are largely determined independently of each other at the producer, distributor and retailer levels. Although the producers and distributors of isos and/or cal hypo often monitor or look at the prices of both dry products and are aware of historical price/volume relationship existing between isos and cal hypo (F. 196-223, *infra*), their pricing decisions are primarily made on the basis of their own product costs and desired margins and the prices of competing sellers of the same sanitizer, be it isos or cal hypo. *E.g.*, Marshall, Tr. 1198-1200, 1204-05; Behnke, Tr. 1697-98; Marcum, Tr. 3985-86, 3992; Vonderlow, Tr. 4812-13; Benson, Tr. 4920-21; Hughes, Tr. 5195-96, 5200; Smith, Tr. 6680#. This is obviously due to the commonly recognized fact that isos have always commanded a substantially higher price than cal hypo, and buyers do not look for price parity between the two products.

193. The evidence also shows that residential pool owners tend to stay with the pool chemical they are comfortable or familiar with and generally do not switch to another sanitizer except when there is a significant price increase or some use-related problems develop with their current product. This tendency appears to be more prevalent among users of iso products. Industry witnesses variously attributed this consumer behavior to the greater convenience of use offered by current iso products and also to the relative affluence of iso-

accustomed pool owners. *E.g.*, Kennedy, Tr. 591-92; Behnke, Tr. 1613-15, 1623; Christensen, Tr. 1929-30; Jonas, Tr. 2222; Aston, Tr. 4462-63, 4501-02; Vonderlow, Tr. 4812, 4865-66; Hughes, Tr. 5346#; Scott, Tr. 5825; Smith, Tr. 6679#. [47]

194. There is testimony that residential pool owners who use isos are generally not particularly price sensitive. (Arakelian, Tr. 5977) A number of industry witnesses testified that residential pool owners who use isocyanurates are not likely to switch in significant numbers to other sanitizers in response to an iso price increase of 5-10%. *E.g.*, Behnke, Tr. 1622; Jonas, Tr. 2227; Sossamon, Tr. 4724, 4730-31; Arakelian, Tr. 5978; Kent, Tr. 6560-61#; Spiegel, Tr. 6824-25) Nathaniel Jonas, a repacker of dry pool chemicals, testified from long experience in pool chemicals marketing dating back to early 1960's that sometime in the mid-1970's a large, incremental increase in the price of isos caused a "small shift" of his customers to cal hypo, and that any iso price increase below 20% would be considered small and would not cause a substantial shift. (Jonas, Tr. 2230-33)

195. To put it another way, although there is direct and head-to-head competition between isos and cal hypo for the pool chemicals business of residential pool owners of this country, cal hypo, which has been on the market since the mid-1950's, has enjoyed a definite price advantage over isos, a relative newcomer which appeared on the scene during the mid-1960's. Thus, the price sensitivity between isos and cal hypo is not pronounced.

3. There Is Industry Recognition of Historical Price/Volume Relationship Between Isos and Cal Hypo

196. There is clear evidence that the industry, based on past observation and experience, generally recognizes that the movements in the relative prices of isos and cal hypo bring about changes in the relative consumption levels of the two products. Recognition of this price/volume relationship between isos and cal hypo pervades the marketing and strategy documents of producers and importers and is also reflected in the testimony of industry witnesses.

197. (For example, Olin's 1983 Pool Chemicals CEO Presentation (RX 52#) contains the following chart (RX 52-N#): [48] # #

198. # # (CX 259-I-J#; CX 260-J#; CX 287-D-K; CX 289#) One such Olin document involves a business review of the 1983 performance of Olin's pool chemicals operations and identifies # # (CX 260-A, J#) Another is Olin's 1983 Pool Chemicals Strategic Plan. (CX 259-E, I-J#)

199. In these high level company documents, Olin # # (CX 259-I-J#; CX 260-J#; RX 52-N#) [49]

200. Olin has also observed that the change in the ratio between iso repacker price and HTH distributor price was reflected in a similar change in retail prices. (CX 259-J#; CX 287-A) # # (CX 280#; CX 283-E#; Kosche, Tr. 8797-8801#) # # (Kosche, Tr. 8794-96#) Thus, the relationship demonstrated by # # reliably reflects the existence of a corresponding price/volume relationship between retail sales of cal hypo and isos.

201. Dr. David Kamerschen, Distinguished Professor of Economics at the University of Georgia, testifying as an economic expert on behalf of complaint counsel, testified that the data in the record were insufficient to permit a cross-elasticity analysis of cal hypo and isocyanurates. However, he considered the price/volume data in evidence as a surrogate for cross-elasticity analysis. (Kamerschen, Tr. 2676-79) Dr. Kamerschen attached sufficient importance to the clear and repeated recognition of such a relationship by Olin in its own internal business planning documents. (Kamerschen, Tr. 2680-82, 2691)

202. Dr. Kamerschen expressed an opinion that a correlation analysis he performed using Olin's price/primary share data confirmed that most of the movement in the relative shares of the two products is attributable to the movement in their relative prices. (Kamerschen, Tr. 2679-93) However, Dr. Kamerschen also testified that limitations on the price/volume data in evidence did not permit him to perform a rigorous statistical analysis of the competitive relationship between isos and cal hypo. (Kamerschen, Tr. 2680-82) Thus, Dr. Kamerschen's correlation analysis is based on limited and incomplete data and its validity, standing alone, is open to doubt.

203. On the other hand, respondent's expert witness, Dr. Ordover, expressed an opinion that the Stigler price correlation test he performed shows that there was no statistically significant relationship between the prices of isos and cal hypo and that, therefore, the two products did not belong to the same market. (Ordover, Tr. 9142-50) Dr. Ordover also testified that the "inferential" residual elasticity of demand test he performed shows that isos and cal hypo did not belong to the same antitrust market because cal hypo was not exerting sufficient constraining influence upon iso prices. (Ordover, Tr. 9142, 9198-9205) Respondent contends that Dr. Ordover's quantitative analyses, employing the Stigler price correlation [50] test

and the residual elasticity of demand test, establish that isos and cal hypo do not belong to the same product market. *See* RB at 52-57.

204. Dr. Ordover's tests and opinions founded thereon were excluded for the reason that respondent had not complied in good faith with applicable prehearing order requirements regarding timely notice and that complaint counsel were not afforded a reasonable opportunity to prepare for cross-examination of Dr. Ordover with respect thereto. Respondent contended that the exclusion order was in error because Dr. Ordover's data is of the type permissible under Rule 703 of the Federal Rules of Evidence. However, the data in question can hardly be characterized as being "of a type reasonably relied upon by experts in the particular field." In the final analysis, the data in question was largely mixed, incomplete, entirely unverified and incorporated information collected and prepared for the purposes of this litigation. Therefore, Dr. Ordover's opinion testimony based on the out-of-court data was properly excluded. *E.g., Barrel of Fun, Inc. v. State Farm Fire & Gas Co.*, 739 F.2d 1028, 1033 (5th Cir. 1984); *Soden v. Freightliner Corp.*, 714 F.2d 498, 502-05 (5th Cir. 1983); *Wilder Enterprises v. Allied Artists Pictures*, 632 F.2d 1135, 1143-44 (4th Cir. 1980); *In re Agent Orange Product Liability Litigation*, 611 F. Supp. 1223, 1246-47 (E.D.N.Y. 1985). In any event, although the theories Dr. Ordover invoked appear sound, the quantitative analyses he performed employed such seriously flawed and essentially unreliable data that his opinions based thereon are not persuasive and are of little value in determining the product market issue in this case. *Also see* CRB at 5-6, 11-18.

205. In any event, the evidence is clear that Olin not only quantified the price/volume relationship between cal hypo and isocyanurates, it took full account of this relationship in planning the business strategies for its pool chemicals operation. Such examples are legion.

206. Olin's 1982-1991 PACE Strategic Plan (CX 267#), initially notes that the # # (CX 267-A#) and identifies this risk as one that # # with the effect of # # (CX 267-J#; *see also* CX 266-M#) Olin's contingency plan for responding to the adverse impact of cal hypo prices on its iso business was to # # (CX 267-J#) [51]

207. Similar recognition of the competitive relationship between the two types of dry sanitizers is also found in the 1982 Strategic Plan for Olin's HTH (calcium hypochlorite) business (CX 271#). This HTH Plan lists as one of its "Strategies and Action Programs" the maintenance of # # and the # # (CX 271-O#)

208. During a March, 1983 negotiation with Nissan/Sumitomo involving Olin's cyanuric acid (CA) requirements for isocyanurates, Mr. Turnipseed, then Director of Marketing Sales for Olin's pool chemicals business, explained that Olin's projections for market demand for isos were somewhat pessimistic due to a recent decline in cal hypo prices. (CX 594-B; Kitagawa, Tr. 2364-65, 2368) According to a telex report of the meeting prepared by Sumitomo-New York, Olin's pessimism was based on the company's observations that (CX 594-B):

Once the price of Cal.Hyp. [sic] rose, while the price of Cl. ICA [isocyanurates] fell, raising the quantity of the sale of CL. ICA. But the price of Cal.Hyp. has been declining for five to six months, thus pushing the quantity of the sale of Cl. ICA down again

Also see CX 595-A,D (notes taken of the meeting by the Sumitomo representative); Kitagawa, Tr. 2376-83.

209. The competitive price/volume relationship between isocyanurates and calcium hypochlorite is confirmed in more recent Olin statements. In a 1984 HTH market strategy analysis document (CX 273#), reference is made to the displacement of cal hypo by isos and the concomitant reduction in the historic cal hypo price advantage (CX 273-B#), and to the fact that one element in reversing this displacement was the maintenance of the # # (CX 273-G#)

210. While developing the 1985 pool chemicals strategic plan, Mr. Turnipseed, then Olin's Director of Marketing and Sales for Swimming Pool Chemicals, circulated a short version of Olin's 1984 strategic plan and noted that the plan was # # and that it was # # (CX 275-A#) That document noted that, to obtain acceptable returns, Olin must # # by, among other things, # # and that any # # for calcium hypochlorite would # # (CX 275-Q1, T, Y#) During an investigational hearing in this matter, Mr. Turnipseed acknowledged that [52] # # (CX 471-Z5#)

211. Finally, during the recent calcium hypochlorite dumping proceeding before the International Trade Commission ("ITC"), Olin maintained the position that the price/volume relationship between cal hypo and isos was a real and significant factor affecting its sales of both products. (CX 386-I; for similar Olin submissions to ITC, *see* CX 175-X, Z11, Z31; CX 283-F#; CX 380-L; CX 383-E, F)

212. PPG, which is the second largest producer of cal hypo in the world next to Olin (but which does not produce isos) (CX 5-A; CX 548-

E; CX 652-E#), also recognizes the price/volume relationship between cal hypo and isos. For example, PPG's 1984 business strategy paper states (CX 548-D):

Consumption of calcium hypochlorite as a swimming pool sanitizer can be affected by chlorinated isocyanurate consumption. Over the past 5 years, chlorinated isocyanurate consumption (trichloroisocyanuric acid, specifically) grew at a faster rate than calcium hypochlorite. We believe the future growth of chlorinated isocyanurates will not be significantly above that of calcium hypochlorite.

. . . a favorable ruling from the FTC [sic] on dumping by the Japanese . . . is expected to increase the price of chlorinated isocyanurates by 25 Percent

213. In the same document, PPG expresses its obvious concern about the adverse impact that low iso prices could have upon cal hypo demand and concluded (CX 548-R):

Olin's high stake in the marketplace with HTH calcium hypochlorite suggests that it will continue to stimulate calcium hypochlorite demand; and it is very unlikely that isocyanurates would be retailed at a low price over the period of time necessary to permanently undercut the product demand for calcium hypochlorite.

214. Similarly, FMC, which produced isos but not cal hypo, also recognized the price/volume relationship between the two products. For example, FMC's pool chemicals management observed an "equilibrium pricing" differential between cal hypo and isos which, if maintained, "means the products grow at the [53] same market share without shifting." (CX 66-D) The same observation is also reflected in handwritten notes of J.M. Polkowski, FMC's industrial and international iso marketing manager, who was subsequently hired by Olin but was unavailable to testify during trial because of temporary physical infirmity. (CX 32-C; Kosche, Tr. 8969-70, 9067-69#)

215. On his working copy of FMC's 1984 pool chemicals plan, James R. Collins, FMC's CDB Business Manager at the time of the acquisition, noted an equation between cal hypo and iso prices which he described as reflecting a "substitution" equation. (CX 30-E; Collins, Tr. 3887-88) Mr. Collins also noted that iso price improvement would be possible, at least in part, because of cal hypo price increases that were anticipated to follow the cal hypo dumping proceeding. (CX 30-E; Collins, Tr. 3888-89)

216. Mr. Collin's outline for a customer sales presentation in October 1984 indicates that he viewed the cal hypo dumping case as providing FMC (an iso producer) with a "great opportunity to grow

market share.” (CX 24; Collins, Tr. 3883-84) Mr. Collin’s testimony is corroborated by that of Wayne Vonderlow, marketing director for Poolquip-McNeme, a large Houston, Texas based distributor of pool products, who recalled Mr. Collin’s sales presentation. (Vonderlow, Tr. 4851-52) Mr. Vonderlow also testified that his superior at Poolquip-McNeme, Mr. McNeme, shared the perception that there is a price/volume relationship between isos and cal hypo. (Vonderlow, Tr. 4852-53) Mr. Vonderlow agreed that there was “a general feeling through the years” by many in the industry of an isos/cal hypo relationship. (Vonderlow, Tr. 4853)

217. Shikoku, a Japanese producer that exports isos to the United States, is alert to the price/volume interaction of the two major dry sanitizers, isos and cal hypo, in the United States market. (CX 577-G#; Ishida, Tr. 943-44) Mr. Ishida, Shikoku’s sole United States field representative, testified that he understood there to be an industry awareness of the pricing gap between cal hypo and isocyanurates. (Ishida, Tr. 942-43) It was also Mr. Ishida’s understanding that fluctuations in the pricing gap influenced demand shifts between the two products. (Ishida, Tr. 943) In the fall of 1985, Mr. Ishida reported his concern to Shikoku-Japan that the cal hypo/iso price gap was widening, leading him to fear a shift to cal hypo by isocyanurate users in the United States. (CX 577-G#; Ishida, Tr. 946) At trial, although unaware of any actual shifting, Mr. Ishida continued to regard such a demand shift as a realistic concern. (Ishida, Tr. 946-47) [54]

218. ICI Americas (“ICI”), an importer of isocyanurates and cal hypo from Japan, expressed the company’s view of the price/volume relationship between isos and cal hypo in ICI’s 1985 water treatment chemicals marketing plan. (CX 127-K#)

219. Earlier in 1984, James Miller, an ICI official, told the ITC that # # (CX 174-Z194#) Nicholas Pettoruto, the ICI official in charge of ICI’s sales of pool chemicals in the United States, testified in this case that he observed some actual shifting of sales away from isos toward cal hypo in recent years when iso prices have risen greater than cal hypo prices (Pettoruto, Tr. 1361-62, 1423#) and that, as the price gap between isos and cal hypo widens, cal hypo sales will likely increase at the expense of isos. (Pettoruto, Tr. 1361#)

220. General awareness in the industry of the existence of a price/volume relationship between isos and cal hypo (Bloom, Tr. 651; Christensen, Tr. 1854-55; Vonderlow, Tr. 4853) is also reflected in observations of repacker, dealer and distributor witnesses. For

example, Mike Marshall of Hydrotech, a repacker owned by Great Lakes Chemicals, expressed the opinion that a 5 to 10% increase in the price of trichlor might be sufficient to induce a consumer using that product to consider dichlor or cal hypo as an alternative. (Marshall, Tr. 1126) John Christensen of Chem Lab, a repacker of dry products and a manufacturer of liquid bleach, testified that a 10-15% increase in the price of cal hypo would cause switching to isos, but not to other sanitizers such as liquid bleach, in situations where a consumer had been using cal hypo as a primary sanitizer. (Christensen, Tr. 1993-96#)

221. Charles Schaub of Coastal, a repacker of both isos and cal hypo, has observed shifting between isos and cal hypo at Agway, one of his major accounts which he monitors on a regular basis. (Schaub, Tr. 2075, 2143-46) In 1982 or 1983, Mr. Schaub observed a 20% increase in iso purchases by Agway which he attributed to a 13% increase in the price of cal hypo, such price increase causing a shift away from cal hypo to isos. (Schaub, Tr. 2075, 2143) Mr. Schaub also recalled that a 10-15% increase in iso prices at Agway led to some switching to cal hypo during the 1980-1981 period. (Schaub, Tr. 2146) Mr. Schaub estimated that a 10% increase in cal hypo prices, assuming no increase in iso prices, would result in a 9 to 10% shift in relative sales volume away from cal hypo to isos. (Schaub, Tr. 2119)

222. Jesse Behnke of Home Depot, a mass merchandiser selling swimming pool chemicals in several southern states, testified that an increase in the price of either isos or cal [55] hypo would cause the consumer to consider shifting to the other dry product. (Behnke, Tr. 1623-24) Ronald Wetzel of D&R Sales, a pool dealer in Toledo, Ohio, testified that he noticed some switching from cal hypo to isos as the price gap between the two products narrowed some time before the ITC anti-dumping suit. (Wetzel, Tr. 5463-65)

223. Nathaniel Jonas of N. Jonas Company, another repacker of isos and cal hypo, testified that a 20 to 25% increase in the price of isos would, based on his experience, be likely to cause a substantial shift to cal hypo. (Jonas, Tr. 2222, 2231) Mr. Jonas recalled one instance of substantial shifting of customers away from isos to cal hypo at the retail level in the mid to late 1970's, when iso prices rose more rapidly than cal hypo prices. (Jonas, Tr. 2222, 2230)

4. Perceptions of Buyers and Sellers

224. The perceptions of manufacturers, purchasers and sellers of

pool chemicals strongly indicate that isos and cal hypo constitute a distinct market apart from other pool chemicals. Olin's planning and marketing documents reflect the same perception. Over the years, Olin planned and evaluated its pool chemicals performance largely in terms of cal hypo and isos.

225. For example, in Olin's 1975 analysis of the market risks associated with its planned isocyanurate entry, one of the # # identified was # # (RX 35-Q#) A 1980 Strategic Plan Overview of Olin's PACE [iso] pool chemicals business also notes the same concern, suggesting that Olin's consumer advertising should # # (CX 264-B#)

226. In a 47-page competitive study of FMC's isocyanurate business conducted in 1981, Olin noted that # # (CX 508-O#) As a result, the Olin study concluded # # (CX 508-P#)

227. In a strategic plan presentation to the CEO in 1982, it is noted that the three key issues in maximizing Olin's sales and profits of cal hypo are (1) # # (2)# # and (3) # # (CX 268-M#) This same CEO presentation document also notes that # # and that [56] # # (CX 268-R#)

228. In a marketing document concerning Olin's brand strategies, it is noted that (CX 278-L#): # #

229. In a section entitled "The Competition: Strategies," the same document denotes the "competition" as HTH (calcium hypochlorite), PACE (isocyanurate) and SUN (isocyanurate). (CX 278-T#) Among observations regarding Olin's cal hypo advertising strategies are that: # # (CX 278-X#) (emphasis in original), # # (CX 278-Z23#) and that # # (CX 278-Z4#)

230. Olin's 1983 Pool Chemicals Strategic Plan refers to a "dry sanitizer market" encompassing both isos and cal hypo but not liquid or gas sanitizers. (CX 259-G#; RX 32-D#) Peter Kosche, Olin's Director of Commercial Development, Water Products and Services Division, wrote about the 1980-1984 period: # # (CX 281-B#; CX 476-Z21-22#)

231. John Swartley, while President of Olin's Consumer Products Group, also underscored the direct competitive interrelationship between isos and cal hypo when he wrote (CX 262-C#): # # .

232. John M. Henske, Olin's Chairman and CEO, in discussing the company's strategic decisions in the pool chemicals business, referred to "the dry product," the isocyanurate and cal hypo part of the market, and the "sodium hypochlorite [bleach] market." (Henske, Tr. 7167-69#) [57]

233. Olin has also recognized the degree of competition between isos and cal hypo in presentations to the ITC in connection with anti-dumping proceedings. At a May 1984 ITC hearing, Olin acknowledged the degree of competition between the products (CX 173-M), with Olin's George Turnipseed stating that "the two products (isos and cal hypo) are very much competing products . . . when it comes to the subject of the swimming pool industry." (CX 173-Y) In February, 1985, Olin advised the ITC that iso prices had some effect on cal hypo demand (CX 175-Z11) and prices (CX 175-Z34) and that the two products were competitive. (CX 175-X-Y) Olin's written submissions to the ITC also acknowledge that isos and cal hypo compete. (CX 283-C, D, F#; CX 378-L#; CX 380-L; CX 381-F; 383-E-F; CX 386-I)

234. Other sellers, through their actions and words, perceive the existence of direct competition between isos and cal hypo. They include FMC, PPG, Monsanto, Nissan, Shikoku, and ICI.

235. FMC has long recognized the direct competition between cal hypo and isos. (CX 54-A-B; CX 880-O#) FMC saw its acquisition of the SUN repacker operation in 1978 as a means of positioning its isocyanurate business against Olin's HTH brand of cal hypo. (CX 54-A-B) An FMC official was quoted in a 1980 chemical industry periodical (and subsequently cited in an Olin competitive assessment of FMC) as saying # # (CX 880-O#)

236. In major national TV ad campaigns designed to establish SUN as a leading national pool sanitizer brand, FMC launched a major, national, consumer advertising campaign during the 1978-80 period. (CX 880-W-X#) Lloyd Bridges was featured in SUN ads to demonstrate the greater consumer ease of using SUN granular isocyanurates compared with cal hypo (CX 880-W, Z26#; Kosche, Tr. 8955-57#), and to tout SUN as a longer-lasting pool chemical than cal hypo (CX 880-W, Z27#), and as more effective than cal hypo. (CX 880-W, Z28#)

237. FMC tested its iso products against cal hypo. (CX 63; Collins, Tr. 3934)

238. PPG's planning documents for its cal hypo business are similarly replete with observations concerning competition with isos, although it does not produce or sell isos. (CX 545-A, C-F, I; CX 546-C, L-M; CX 548-D, L, V; CX 550-L) For example, in its 1983 Calcium Hypochlorite Business Strategy Paper, PPG noted that "[c]onsumption of calcium hypochlorite as a swimming pool [58] sanitizer can be affected by chlorinated isocyanurate consumption

...” (CX 546-C) and identified isocyanurate suppliers, estimated the regional dispersion of isocyanurate users and planned “a comprehensive shelf life study and cost/benefit analysis [to] be conducted to establish quantitative competitive data on the various chlorinated isocyanurate and calcium hypochlorite products available today.” (CX 546-C, L-M)

239. In its 1984 Calcium Hypochlorite Business Strategy Paper, PPG compared the growth rates of cal hypo and isocyanurates, observing that iso consumption grew faster than cal hypo consumption over the previous five years but predicting that isos would not grow significantly faster than cal hypo in the future. (CX 548-D) The 1984 paper also included PPG estimates of domestic isocyanurate demand, the capacity of each domestic isocyanurate producer and isocyanurate import and export levels. (CX 548-V)

240. Richard Hughes, the business manager for PPG’s cal hypo business, testified that isos and cal hypo compete (Hughes, Tr. 5331), that PPG monitors iso supply and demand conditions (Hughes, Tr. 5276-77#) and that PPG subscribes to a clipping service which, at PPG’s request, tracks retail prices of cal hypo and isos (but not any other pool chemicals). (Hughes, Tr. 5280)

241. Monsanto, an isocyanurate producer, monitors and responds to cal hypo marketplace activity. (CX 218-B#; Marcum, Tr. 3992-93, 4008-09, 4128-30, 4134) Monsanto keeps abreast of cal hypo capacity. (Marcum, Tr. 3993) Monsanto tracks calcium hypochlorite prices, in particular HTH prices, and the transaction prices of bulk sales to repackers (Marcum, Tr. 3991-92, 4009, 4134) and takes HTH prices into account in setting its isocyanurate prices. (Marcum, Tr. 4134)

242. In September, 1983, Monsanto’s isocyanurate business manager recommended holding iso prices at current levels for the upcoming 1984 pool season in part to # # (CX 218-B#; Marcum, Tr. 4129-30#) Michael Marcum, Monsanto’s isocyanurate business manager, testified that, of all non-isocyanurate pool chemicals, pricing developments involving cal hypo have the greatest significance for Monsanto’s isocyanurate price decisions. (Marcum, Tr. 4128#)

243. As a service to its repacker customers, Monsanto prepares market data presentations concerning the United States pool chemicals business. (CX 4-A-Z4; Christensen, Tr. 1874) A typical Monsanto presentation contains a wide range of market data (*e.g.*, supply and demand figures, prices, market share estimates) for both isocyanu-

rates and cal hypo. [59] (CX 4-D-Q; Christensen, Tr. 1883-90) The Monsanto presentation has separate sections for residential and commercial pools (CX 4-L, U; Christensen, Tr. 1889) and isos and cal hypo dominate the residential pool section. Bleach, the only other product listed in the residential section, received a cursory treatment. (CX 4-L-T)

244. Nissan, a Japanese iso producer and exporter to the United States also recognizes the close competitive interaction between isos and cal hypo. In an April, 1982 letter, a Nissan official requested a meeting with Olin to exchange views on topics of mutual interest (CX 247#) and identified # # among the topics. (CX 247-B#) At an Olin/Nissan meeting in June, 1982, the Nissan representative made note of Olin's views regarding cal hypo supply conditions. (CX 248-G#) The Nissan notes to the meeting reflect Olin's observation that # # (CX 248-G#; CX 676-Z168-69#) Olin notes to the same meeting reflect that Olin and Nissan views on the demand and supply situation of both isos and cal hypo were a topic of discussion. (CX 316-B#)

245. Shikoku, a Japanese producer of isos and exporter to the United States, takes into account the competition it faces from cal hypo. Mr. Ishida, the Shikoku representative who testified at the trial, stated that in Shikoku's view "calcium hypochlorite is a major competitive product of the isocyanurate" and that # # is a topic of conversation in meetings with ICI, Shikoku's United States sales agent. (Ishida, Tr. 935; *see also* Pettoruto, Tr. 1321) Shikoku also follows cal hypo price movements (Ishida, Tr. 942) and has asked ICI to # # (CX 577-H#; Pettoruto, Tr. 1401#) Other Shikoku's documents show that Shikoku monitors cal hypo prices, demand, supply, and capacity in the United States. (CX 177-Z3; CX 565-A; CX 577-G#, CX 582-C, D#; RX 148-E; Ishida, Tr. 944-47, 956-57#)

246. ICI America, Shikoku's United States sales representative, also recognizes the degree of competition between isos and cal hypo. (CX 127-K# CX 132-A; Pettoruto, Tr. 1321, 1348#, 1358-62#, 1401#) In August, 1985, ICI America reported to Shikoku that "the influence of cal hypo pricing" was one of five "controlling factors" on iso bulk prices to repackers. (CX 132-A)

247. ICI's James C. Miller told the ITC in March, 1984, that cal hypo is a substitute for isos and that, prior to the ITC [60] anti-dumping rulings, decreased cal hypo prices were having a dampening effect on isos prices. (CX 174-Z169-70#)

248. Major pool chemicals repackers and distributors, in assessing their competition, also look at both cal hypo and isocyanurates. For example, Poolquip-McNeme was a distributor of FMC's SUN (iso brand) and a large buyer of FMC's isocyanurates. (Vonderlow, Tr. 4789) Within Poolquip's primary marketing territory, Wayne Vonderlow, the company's director of marketing, believed that cal hypo and isocyanurates are the two most popular sanitizers used by residential pool owners to maintain their pools and that, together, the two products account for virtually all such pool chemical usage. (Vonderlow, Tr. 4819; 4860) The competition between iso and cal hypo in Poolquip's marketing area resulted in market share shifting from cal hypo to isocyanurates. (Vonderlow, Tr. 4848)

249. Steelcrete Company was another major customer/distributor of FMC isocyanurates. (Scott, Tr. 5783) Steelcrete's president, Fred Scott, acknowledged the direct competitive interaction between calcium hypochlorite and isocyanurates. (Scott, Tr. 5826-27) According to Mr. Scott, after FMC acquired the SUN repacker business, the distribution of SUN isocyanurates was restricted to pool professionals. (Scott, Tr. 5749-50) Mr. Scott observed that the withdrawal of the SUN product from department stores, hardware stores and chain stores generally created a void that contributed to Olin's successful efforts to sell its HTH brand of cal hypo through these same outlets. (Scott, Tr. 5826-27)

250. The president of Benson Pump Company, another SUN distributor, considered cal hypo to be the principal alternative to isocyanurates and treated calcium hypochlorite as "a generic term for an alternative to isos" (Benson, Tr. 4960) Mr. Benson on occasion told his iso suppliers he was considering increasing his cal hypo purchases in an attempt to negotiate better isocyanurate prices. (Benson, Tr. 4960)

251. York Chemical Corporation currently repackages both cal hypo and isocyanurates. (Castagnoli, Tr. 2427, 2429) At one point York only repackaged isocyanurates, but the company nevertheless followed cal hypo prices because, in the words of York's president, "we were aware about the impact that the prices of other dry products would have on our own dry products." (Castagnoli, Tr. 2448) And York communicated with its isocyanurate supplier a concern that low cal hypo prices would adversely effect York's isocyanurate sales volume. (Castagnoli, Tr. 2448, 2488-89) [61]

252. Jesse Behnke, a merchandiser for the Home Depot chain of

mass merchandisers, recognized the existence of substantial competition between the two dry sanitizers because isos and cal hypo are viewed by consumers as close substitutes. (Behnke, Tr. 1610-21)

253. Nathaniel Jonas of N. Jonas Company also acknowledged the competition between isos and cal hypo, testifying that isos and cal hypo compete "most directly" with each other. (Jonas, Tr. 2221)

5. Research and Development Competition

254. The research and development efforts of the pool chemicals manufacturers clearly indicate a head-to-head competition between isos and cal hypo, suggesting that the two products belong in the same antitrust market. Olin and PPG, the only significant domestic producers of cal hypo, both have undertaken substantial product development programs to produce cal hypo products simulating the isocyanurate performance characteristics valued by residential pool owners. (CX 548-G, L; Kosche, Tr. 8806-07, 8829-31#)

255. Among residential pool owners, the most popular iso product has long been the large trichlor tablet. (Kosche, Tr. 8821-22#) The large trichlor tablet offers the convenience of a single weekly application. (Kosche, Tr. 8821-22#) The trichlor tablet, once inserted in a feeding device in the pool, dissolves slowly, allowing the chlorine to be gradually released into the pool water over a period of approximately seven days. (Kosche, Tr. 8822-25#) Calcium hypochlorite products, both granules and tablets, are fast dissolving products that typically are applied every day or every other day. (Kosche, Tr. 8826-27#)

256. Olin's 1982 HTH Strategic Plan identified a research program to develop # # (CX 271-R#) The importance of developing more convenient feeding devices for cal hypo was again noted in Olin's 1983 Pool Chemicals Strategic Plan. (CX 259-V#) A 1984 Olin pool chemical plan summary also identified # # (CX 275-V#)

257. At the time of the acquisition, # # (Kosche, Tr. 8851, 8858#) According to Olin's Pool Chemicals 1985 Business Development Plan, the objective of one project was to [62] # # (CX 309-J#) # # (Kosche, Tr. 8851#) # # (Kosche, Tr. 8851-52#) # # (Kosche, Tr. 8861-63#)

258. A second major Olin product development program underway in 1985 concerned # # (Kosche, Tr. 8858#)

259. # # was the program designated to receive the largest share of the Olin 1985 budget for calcium hypochlorite product develop-

ment. (Kosche, Tr. 8867-68#) In September, 1985, during the 1986 budget preparation process, a technology presentation proposed that the # # (Kosche, Tr. 8863, 8869#)

260. Also, in 1983 Olin undertook a major product development program to # # so as to reduce the residue sometimes deposited in the pool. (CX 259-T#; CX 294#; Kosche, Tr. 8869#) # # (CX 294#; Kosche, Tr. 8870-71#) As a result, # # (Kosche, Tr. 8872-73#)

261. PPG's cal hypo business manager Richard Hughes estimated that, of PPG's research and development funds allocated over the prior years to cal hypo, # # (Hughes, Tr. 5257-58#) According to Mr. Hughes, # # (Hughes, Tr. 5257, 5259#) # # (Hughes, Tr. 5257-59#)

262. PPG's cal hypo business strategy papers of the 1982-1984 period clearly show that PPG's principal R&D projects that were given "a near term high priority" included development of means of improving the stability of cal hypo, slowing down cal [63] hypo's dissolution rate and devising a new cal hypo delivery system, all designed to improve cal hypo's effectiveness and ease of application and to increase consumer acceptance. *See* CX 545-H, L; CX 548-C, G, L, N; and, CX 550-B. PPG's 1984 Calcium Hypochlorite Business Paper also stated that PPG had recently introduced cal hypo tablets and noted that the slow release benefit of the tablets was attractive to consumers and made cal hypo "more advantageous to use." (CX 548-G)

263. The R&D efforts of Olin and PPG reviewed hereinabove are targeted to isos and demonstrate that isos and cal hypo compete head-to-head, that they are close enough substitutes for each other and that they belong to the same antitrust market for the purposes of this case.

6. Supply-Side Substitutability

264. In addition to the various factors discussed hereinabove, there are other well-recognized indicia that are useful in determining the product market in a merger case. And one such factor is the supply-side substitutability or unique production facilities or specialized vendors.

265. The evidence is clear that the technology or equipment employed to manufacture isos cannot be used or adapted to produce cal hypo. *E.g.*, CX 442-A,B#; Marcum, Tr. 3979-80; Hughes, Tr. 5191.

266. Other than chlorine and caustic soda, cyanuric acid, the basic

chemical input used to produce isos is different and distinct from the raw materials used to manufacture cal hypo.

267. Thus, there is no production or supply-side substitutability between isos and cal hypo, and this is a factor which argues against placing the two products in the same product market.

7. Convenience Factor

268. The record is clear that isos and cal hypo, the two dry pool chemicals, share a number of technical product characteristics which make them distinctly more convenient for residential pool owners to use and, for that reason, they belong to the same product market. *See* F. 181-89, *supra*.

269. However, this is not to ignore the existence of significant differences in the degree of convenience between isos and cal hypo such that consumers appear to be willing to pay for iso products not insignificant price premium more than 10% over cal hypo prices. [64]

270. For one thing, isos are stabilized and generally last longer than cal hypo. In order to stabilize a pool sanitized with cal hypo, one must occasionally add cyanuric acid to the pool water. (Kennedy, Tr. 588; Schaub, Tr. 2181-83; Marshall, Tr. 1688-89) Dichlor can last up to four times as long as cal hypo. (Aston, Tr. 4462-63) Isos generally need to be added to the pool water about once every four days, while cal hypo must be added every two days. (Behnke, Tr. 1686-87; Marcum, Tr. 5207-08)

271. Secondly, unlike isos, cal hypo can leave a residue in the pool water because it contains insolubles. (Arakelian, Tr. 5979-80) This is a particular problem in areas with hard water. (Christensen, Tr. 1826-27) Cal hypo, when such residue deposits on the bottom of pools, can stain or pin-hole or bleach vinyl-lined pools. (Kennedy, Tr. 607)

272. Also, as noted hereinabove, although both iso and cal hypo products are available in either granular or agglomerated form today, cal hypo is still commonly sold in granular form and needs to be broadcast over the pool water daily or every other day. On the other hand, more isos are sold in compressed tablet or stick form than granular. Compressed iso tablets or sticks are placed into floaters or skimmers to permit them to erode slowly into the pool water. Although compressed and other long-lasting cal hypo delivery devices have been introduced during the recent years, they are not as free from some technological problem as isos and a wide consumer acceptance of these improved cal hypo products is yet to be established. (Spiegel, Tr. 6866-67)

273. However, every form of pool chemical requires a residential pool owner to test and adjust the pH of the pool water on a regular basis, and no pool chemical on the market today frees the consumer altogether from some periodic testing and adjustment chores. That blessed day when one can simply apply a pool chemical product to pool water and forget about pool sanitization for the pool season is not here. In the matter of ease of use and consumer convenience, therefore, it comes down to a matter of degree. And, on the convenience scale, isos and cal hypo are close enough together to set them apart from bleach, which, in those regions of the country where it is generally available, enjoys a substantial price advantage over both isos and cal hypo.

274. It is therefore found that, from a review of such realistic yet circumstantial evidence related to the products produced and sold by the merging firms, the technical product characteristics, the perceptions of sellers and buyers and R&D [65] competition between product groups and producers, isos and cal hypo belong to the same antitrust market for the purposes of this case.

C. Iso Alone Also Constitutes a Valid Product Market

275. The parties agree that isocyanurates constitute an appropriate product market in this case as alleged in the Complaint.

1. Product Characteristics

276. Dichlor and trichlor are dry pool chemicals. Both are highly concentrated and relatively stable chemicals that retain their sanitizing strength for a long period of time.

277. Because of their dry, highly concentrated, stable characteristics, dichlor and trichlor are similar in their relative ease with which residential pool owners are able to purchase, transport, store and handle them.

278. The ITC report in the isocyanurate dumping proceeding acknowledged that trichlor and dichlor are generally considered interchangeable products. (CX 179-M) Olin has also acknowledged similarities between the two products in the ITC proceeding. (CX 174-Z125#)

2. Production Substitutability

279. The production facilities used to manufacture dichlor and those used for trichlor are largely interchangeable. FMC's isocyanurate

plant at South Charleston consists of three production lines for the chlorination of cyanuric acid into isocyanurates. (CX 64-Z33) As originally built, two lines produced dichlor and one, trichlor. (CX 64-Z33; Collins, Tr. 3829) During 1983, FMC converted one of the two dichlor production lines into a "swing" line capable of producing either dichlor or trichlor. (CX 64-Z33-34; CX 442-A#; Collins, Tr. 3829-30) In 1983 and again in 1984, the FMC swing line produced dichlor for part of the year and trichlor for the remainder of the year. (CX 64-Z34)

280. FMC's modification of a dichlor production operation into a swing line capable of producing either dichlor or trichlor took less than six months to accomplish. The Specialty Chemicals Division's 1982 Strategic Plan presentation to FMC corporate management on September 24, 1982, included a proposal to convert a dichlor production line to trichlor production at an estimated cost of \$100,000. [66] (RX 125-Z13; Collins, Tr. 3622) By March, 1983, FMC accomplished the conversion and was manufacturing trichlor on two of its three isocyanurate production lines. (CX 64-Z34)

281. Monsanto currently has a trichlor facility that was originally built as a dichlor production facility. (CX 232-W) Prior to 1981, Monsanto used this facility alternately in the course of a production year to make both trichlor and dichlor. (CX 232-Z2)

282. Olin has also acknowledged that it is feasible for an isos producer to shift production capacity readily from dichlor to trichlor. (CX 442-A#; CX 644-F) The ITC report in the isocyanurate dumping proceeding similarly concluded that the same equipment can be used to make dichlor and trichlor. (CX 179-Z41)

3. Perceptions of Buyers and Sellers

283. Buyers and sellers of pool chemicals commonly use the generic term "isocyanurates" or "isos" to refer to a trichlor or dichlor product rather than the more specific term. (CX 672-Z22#; Wilson, Tr. 4240; Hughes, Tr. 5313) Some long time participants in the pool chemical industry are not knowledgeable about the different product characteristics of trichlor and dichlor. Some do not know whether iso tablets are trichlor or dichlor. (Russ, Tr. 5684-85; Scott, Tr. 5847-48)

284. Buyers and sellers of pool chemicals usually monitor marketplace activity concerning isocyanurates in the aggregate only. A typical Monsanto presentation to its repacker customers contained isocyanurate supply and demand estimates, isocyanurate prices,

isocyanurate production capacity estimates, and market share figures for isocyanurates, but no separate data for dichlor or trichlor. (CX 4-D, F-I, K) Similarly, Olin's market studies of pool chemical usage usually contain information and discussion of isos as a single product and do not contain separate dichlor/trichlor data. *E.g.*, CX 284-E, G, Q-Z16#; RX 111#. [67]

D. Liquid Bleach Does Not Belong to the Same Antitrust Market With Isos and Cal Hypo

1. Pool Bleach is Produced and Distributed on a Local or Regional Basis

285. Pool bleach is produced and sold on a local or regional basis. The use of pool bleach by residential pool owners has historically been confined to a few, well-defined "pockets," comprising often metropolitan areas where pool bleach is produced or the areas within a 200-300-mile radius of a pool bleach plant. Such areas include parts of Florida, southern California, upstate New York and the Detroit-Chicago area. *E.g.*, CX 264-D#; Castagnoli, Tr. 2441-44; Marcum, Tr. 4134#; Smith, Tr. 6687#.

286. Neither Olin nor FMC produced or marketed pool bleach. There is no firm which produces or markets pool bleach on a national scale. There is no national brand of pool bleach (Marcum, Tr. 4135#) while such brand names as SUN (isos) and HTH (cal hypo) are nationally known and widely sold.

287. Bleach is uneconomical to ship long distances. (Marcum, Tr. 4134-35#) There are high transportation costs relative to product price associated with the distribution and sale of pool bleach. (Benson, Tr. 4959; Scott, Tr. 5802-03) Because it is not economical to ship long distances, most pool bleach is sold within a radius of 200 to 300 miles of a bleach plant. (Schaub, Tr. 2110; Wilson, Tr. 4303; Scott, Tr. 5765; Hammersmith, Tr. 6029-30, 6089) When bleach was shipped beyond that area (upward of 400 miles), it was by a distributor who shipped bleach along with dry pool chemicals he sold. (Christensen, Tr. 1858-59)

288. Pool bleach is not widely available in all regions of the country. (Christensen, Tr. 1949, 1968#; Jonas, Tr. 2225-26, 2264) Wayne Vonderlow of Poolquip, whose marketing area stretches from Texas north to the Dakotas in the central United States (Vonderlow, Tr. 4771, 4776-77, 4819), testified that, unlike isos and cal hypo, pool bleach was not widely available in his marketing area. (Vonderlow, Tr.

4834-35) Mr. Castagnoli of York Chemical testified that pool bleach was available and widely used only in certain “pockets” of the country. (Castagnoli, Tr. 2441-44) Although a number of Olin witnesses, who appeared to be bleach enthusiasts, testified that pool bleach marketing is expanding beyond the traditional pockets or regions, the record as a whole clearly and convincingly demonstrates that pool bleach does not compete with iso and cal hypo on a national basis. [68]

289. # # (CX 283-D#) # # (CX 264-D#)

290. Respondent argues that bleach is available as a primary pool sanitizer throughout the country and that, in terms of the number of pools, bleach is the third most popular pool sanitizer nationally, with an estimated share of 15-20% of all residential pools. RB at 67-68; *also see* RPF 711-30. However, respondent’s argument regarding the national scope of bleach distribution and use is simply not borne out by the record evidence. On the contrary, the local and regional nature and scope of bleach use for residential pools is a fact well-recognized by all segments of the pool chemicals business. The testimony of some bleach advocates regarding their possible future expansion plans or their undocumented and expansive references or top-of-the-head estimates of bleach share of the “market” in some areas of the country, however, is not sufficient to overcome the weight of contrary evidence in the record.

291. Therefore, although pool bleach is a functional substitute for isos and cal hypo for pool sanitization, it would be inappropriate to place bleach in the same antitrust market with isos and cal hypo. We are not aware of any reported merger case where the products included within the relevant product market did not flow or compete within the same geographic market or markets.

2. Technological Product Characteristics and Uses Set Bleach Apart from Isos and Cal Hypo

292. Furthermore, because of certain differences in the product characteristics of isos, cal hypo and bleach, there is a marked convenience gap between isos and cal hypo on the one hand and bleach on the other hand.

293. Pool bleach contains a very low concentration of chlorine. (Pettoruto, Tr. 1349#; Schaub, Tr. 2172; Marcum, Tr. 4132#; Smith, Tr. 6720#) Most pool bleach is sold with a label strength of 10% chlorine content. *E.g.*, Behnke, Tr. 1601; Christensen, Tr. 1782;

Marcum, Tr. 4132#; Benson, Tr. 4913; Roberts, Tr. 5047; Wetzel, Tr. 5431; Moran, Tr. 5597. Thus, pool bleach is almost 90% water. (Marcum, Tr. 4132#; Wetzel, Tr. 5431) In fact, it is not possible to produce liquid bleach with a much higher concentration of available chlorine, in the [69] 65 to 75% range. (Schaub, Tr. 2172; Jonas, Tr. 2226) Therefore, much larger amounts of bleach are required to sanitize a pool compared with isos or cal hypo. (Kennedy, Tr. 481; Smith, Tr. 6720#)

294. Pool bleach is considered to be a relatively unstable form of available chlorine. (CX 455-N; Kennedy, Tr. 461; Vonderlow, Tr. 4861-62) Pool bleach is also not as long lasting as the isos or cal hypo (Marcum, Tr. 4140; Wetzel, Tr. 5451) and must be applied more often. (CX 295-H#; Behnke, Tr. 1600; Schaub, Tr. 2187; Smith, Tr. 6720)

295. Pool bleach loses much of its chlorine strength in a relatively short period of time (Kennedy, Tr. 461; Christensen, Tr. 1783; Schaub, Tr. 2048; Castagnoli, Tr. 2508-09; Marcum, Tr. 4133#; Wilson, Tr. 4379; Wetzel, Tr. 5461; Smith, Tr. 6668-69#; Kosche, Tr. 8452-53#) and do so rapidly especially in warm weather or bright sunlight. (Kennedy, Tr. 461-62; Christensen, Tr. 1783; Schaub, Tr. 2048; Castagnoli, Tr. 2508-09; Sossamon, Tr. 4751; Vonderlow, Tr. 4862-63) One witness estimated that pool bleach could lose as much as half of its chlorine content if exposed for one afternoon on a hot, sunny day. (Christensen, Tr. 1783)

296. Pool bleach also has a short shelf life and even when properly stored, loses much of its chlorine content within 25 to 30 days after it leaves the plant. (Behnke, Tr. 1602; Christensen, Tr. 1783; Marcum, Tr. 4133#; Wilson, Tr. 4339; Vonderlow, Tr. 4862-63)

297. Use of a pool bleach also requires more frequent checking of the pH level in the pool water and a greater amount of pH adjusters than do isos or cal hypo. (Kennedy, Tr. 485-86; Schaub, Tr. 2057, 2064, 2179-80; Jonas, Tr. 2226-27) It also requires the use of muriatic acid as a pH adjustor. Muriatic acid is a highly corrosive and reactive material and mixing of bleach and muriatic acid can result in a potentially dangerous situation. (Hughes, Tr. 5291-93, 5357#)

298. Spillage and leaks are also often mentioned as a problem with bleach, which can cause damage to clothes, car seats or skin. *E.g.*, CX 295-H#; Kennedy, Tr. 482; Behnke, Tr. 1600; Schaub, Tr. 2062; Jonas, Tr. 2226; Marcum, Tr. 4133#; Wilson, Tr. 4341; Aston, Tr. 4568; Benson, Tr. 4951; Roberts, Tr. 5125; Hughes, Tr. 5292#. This problem results in part from the use of vented caps, which are required by EPA for all pool bleach containers. (Wilson, Tr. 4341)

299. A survey of residential consumer preferences prepared for Olin by Grey Advertising identified the following [70] # # (CX 295-H#)
#

300. FMC's 1980 Strategic Plan looked at the residential pool market and concluded that bleach is an inconvenient product from the standpoint of the residential pool owner. (CX 664-Z4)

301. Witnesses agreed that bleach is an inconvenient product to use. (Kennedy, Tr. 481; Pettoruto, Tr. 1349, 1484#; Jonas, Tr. 2225-26; Castagnoli, Tr. 2509; Marcum, Tr. 4133#; Wilson, Tr. 4338; Sossamon, Tr. 4648#; Hughes, Tr. 5265#; Wetzel, Tr. 5460; Arakelian, Tr. 5975; Kent, Tr. 6614-15#) The convenience gap between isos and cal hypo, on the one hand, and bleach, on the other, is greater than the convenience gap between isos and cal hypo. (Schaub, Tr. 2066; Kamerschen, Tr. 2668-69, 2961-63)

302. Convenience is an important factor in the consumer's choice of pool sanitizer. (CX 264-D#; Bloom, Tr. 661; Vonderlow, Tr. 4859; Hughes, Tr. 5202) Olin documents and consumer surveys conclude that convenience is the most important product characteristic from the standpoint of winning consumer acceptance. (CX 264-D#; CX 276-Z1; CX 295-I#) PPG's Mr. Hughes testified that his firm's consumer surveys identify convenience as the number one factor in choosing a pool chemical, ahead of price. (Hughes, Tr. 5201-02)

303. The evidence is also clear that bleach is not a viable product as a residential pool chemical on a national basis and the principal pool bleach buyers are the pool service industry and commercial and institutional pool operators. (CX 4-M, V; CX 128-B#; CX 430-V#; Jonas, Tr. 2225) Southern California, which is a good bleach market, is known to have a large pool service industry. (CX 486-F#; Christensen, Tr. 1825)

304. Pool service companies generally contract with a residential pool owner to clean the pool and maintain proper pool water sanitization by periodic service visits, generally on a weekly, bi-weekly or monthly basis. *E.g.*, Sossamon, Tr. 4738-39, 4750, 4752-53; Scott, Tr. 5745; Breving, Tr. 6209-10.

305. Pool bleach is not considered a viable pool chemical in New England and the Northeastern United States. [71] There is little bleach sold for residential pools in the Eastern United States. (Schaub, Tr. 2163; Jonas, Tr. 2225-26, 2264; Arakelian, Tr. 5922-23) The evidence also strongly indicates that bleach as a residential pool chemical is largely limited for shock treatment or superchlorination. *E.g.*, CX 664-Z.

3. Price Sensitivity

306. The evidence clearly shows that where pool bleach is sold its prices are determined entirely independent of the prices of other pool chemicals such as isos or cal hypo.

307. Bleach prices vary widely from one city to another even within a region, depending on the amount of bleach competition serving the city. (Roberts, Tr. 5097-99; Scott, Tr. 5815-20; Arakelian, Tr. 5933-36; Hammersmith, Tr. 6096; Smith, Tr. 6741#) Fred Scott of Steelcrete did not observe similar variations in the prices of isos or cal hypo in his marketing area. (Scott, Tr. 5821)

308. The only witness from the mass merchandising segment of the pool chemicals business who testified, Jesse Behnke of Home Depot, testified to his perception that “a different customer”—less affluent and more price sensitive customer—buys liquid bleach. (Behnke, Tr. 1613-14) Marshall Bloom of Bio-Lab, the largest repacker of dry sanitizers in this country expressed a similar viewpoint. (Bloom, Tr. 645-48) Bleach is the least expensive pool chemical one can buy.

309. The evidence also clearly shows that the prices of isos or cal hypo are not influenced by bleach prices. It is also clear that residential customers generally do not switch from isos or cal hypo to bleach because of price reduction in bleach.

310. # # (CX 259-I#; CX 260-I#; CX 280-B#; CX 283-E#; CX 284-Q#; CX 647#; *see* Kamerschen, Tr. 2671-73, 2693-94)

311. A July, 1982 Olin analysis of pool sanitizer pricing in the Sunbelt region focuses on the prices of isos and HTH (Olin's cal hypo brand) and contains no mention of bleach prices. (CX 287) # # (CX 311-M#; RX 380-C) [72] # # (CX 311-O#)

312. A significant increase in the price of isos or cal hypo would not result in substantial shifting of consumers to bleach. (Christensen, Tr. 1993# [10 to 15% price increase, no shifting]; Schaub, Tr. 2119 [10% increase in cal hypo prices, no substantial shifting]; Jonas, Tr. 2227 [20-25% increase, no substantial shifting]; Aston, Tr. 4501-02 [10-15% increase, no shifting])

313. Fred Scott of Steelcrete testified that his decision to add new pool bleach production capacity was based on an analysis of capacity of existing pool bleach producers in his area. (Scott, Tr. 5854-55) Mr. Scott did not consider cal hypo or iso capacity or supply in his area. (Scott, Tr. 5854-55)

314. It appears to be the general perception of sellers, repackers, and resellers in the pool chemicals business that bleach does not have

much impact on the sales of isos and cal hypo. (Bloom, Tr. 691; Pettoruto, Tr. 1322; Christensen, Tr. 1819, 1821; Schaub, Tr. 2066; Jonas, Tr. 2260; Castagnoli, Tr. 2460)

E. Exclusion of Other Pool Chemicals, Gas and Chlorinators from the Product Market in this Case Is Appropriate

315. Other pool chemicals, such as lithium hypochlorite, brominated sanitizers and chlorine gas, chlorine generators, ozonators, and Baquacil, are properly excluded from the scope of the relevant market. These chemicals and devices account for an insignificant portion of overall sanitizer usage in residential pools (CX 664-Z4) and are marginal products which do not constrain the pricing decisions of the producers and sellers of isos and cal hypo. (Kamerschen, Tr. 2813-15#; Ordovery, Tr. 9136)

316. Lithium hypochlorite, which is occasionally used as a shock treatment, does not constrain the pricing decisions of suppliers of isos and cal hypo. (CX 471-Z19#; Christensen, Tr. 1933-34) Lithium hypochlorite is expensive, low in chlorine content compared to isos or cal hypo, and has several other disadvantages and few offsetting advantages to justify its greater cost.

317. Brominated sanitizers, which are used mostly in spa and hot tub applications, do not serve to constrain the pricing decisions of suppliers of isos and cal hypo. (CX 127-K#; CX 471-Z20-Z21#; Castagnoli, Tr. 2459; Marcum, Tr. 3985-86, 4128#) Brominated compounds are more expensive and less effective than [73] the chlorine-based pool chemicals and have some significant side-effects which have attracted the attention of public health officials.

318. Chlorine gas, which is used almost exclusively in commercial pools, does not constrain the pricing decisions of suppliers of isos and cal hypo. (CX 471-Z21#) Because of the hazards associated with the use of chlorine gas, it is not a product which a residential pool owner could practicably turn to in the event of a rise in the price of isos or cal hypo.

319. Mechanical devices such as chlorine generators and ozonators are expensive devices and do not constrain the pricing decisions of isos and cal hypo. These devices have existed for a number of years and their impact has been insignificant, primarily because of their greater initial cost and operating and repair expense. In addition, ozonators require the use of chlorine-based sanitizer and are not true functional substitutes for isos or cal hypo.

320. Baquacil is a liquid-based system and # # The product is expensive, incompatible with chlorine-based systems, and requires use of two additional products.

V. THE RELEVANT GEOGRAPHIC MARKET

A. Introduction

321. The parties disagree on the appropriate geographic market in which to assess the effects of the challenged acquisition. While the Complaint alleges (Complaint ¶ 14) and complaint counsel adhere to a geographic market comprising the United States as a whole, respondent advocates a worldwide market for isos and cal hypo.

322. The purpose of determining a geographic market in this case is of course to assess correctly the effects of the challenged acquisition to see if it is likely to lessen competition substantially “in any section of the country.” The traditional approach has sought to determine geographic market boundaries in terms of product movements by the use of so-called Elzinga-Hogarty test. See Elzinga and Hogarty, *The Problem of Geographic Market Delineation in Antimerger Suits*, 18 Antitrust Bull. 45, 52-59 (1973).

323. The revised *DOJ Guidelines*’ approach goes further and asks whether enough production *capacity* outside the postulated geographic market could be easily diverted into the [74] market so as to make a price increase by the sellers inside the market to a supracompetitive level unprofitable. (*DOJ Guidelines* § 2.31) Similar approach might be employed in treating imports of the relevant products into the United States in this case. (Kamerschen, Tr. 2698, 3081-83; Ordoover, Tr. 9246-47)

324. However, the economic evidence in the record is not sufficient to permit a rigorous quantitative analysis for making that determination as envisioned by the revised *DOJ Guidelines*. (Kamerschen, Tr. 3081-83) And no statistical analysis of such quantitative data was presented by the economic expert of either party regarding the geographic market issue.

325. In any event, the parties agree that imports of isos and cal hypo into the United States have been substantial and that, therefore, a correct assessment of the competitive effects of the challenged acquisition must take the imports into account.

326. Dr. Ordoover, respondent’s economic expert witness, has suggested that, in cases where, as here, reliable information is not available on the amounts of foreign capacity which can be readily

diverted to the United States in response to price increases in the United States, the market impact of foreign producers be measured on the basis of actual imports into the United States. (Ordoover, Tr. 9651-52; see Ordoover and Willig, *The 1982 Department of Justice Merger Guidelines: An Economic Assessment*, 71 Cal. L. Rev. 535, 546 (1983)) This approach is in accord with the customary treatment of imports employed in antitrust analysis in recent Section 7 cases.

327. At the same time, it has been recognized that the actual import sales or shipment data, or foreign production capacity may overstate the competitive significance of foreign producers in the United States markets. See *DOJ Guidelines* § 3.23. Also important in this context are such market factors as non-quota restraints or barriers to free movement of products, the direction and extent of exchange rate changes, and the extent of foreign capacity. *Id.*

328. Dr. Ordoover, respondent's economic expert, testified that his approach to the geographic market and the treatment of foreign capacity is to include all United States productive capacity, all imports, and that foreign capacity readily divertable to the United States in the event of a domestic price increase. (Ordoover, Tr. 9239) However, he would not include within the market the foreign capacity of a firm not presently exporting into the United States. (Ordoover, Tr. 9267#) [75]

329. Dr. Ordoover also indicated that pricing of imports is generally more important than the volume of imports in assessing the possible effects of a merger on competition. (Ordoover, Tr. 9657-58)

330. Also, Dr. Ordoover has recently expressed the view that, according to the results of mathematical model relating to international trade and international competition, foreign competition is a less reliable restraint on the market power of domestic firms than domestic competition. (Ordoover, Tr. 9669-70) In Dr. Ordoover's own words:

This [mathematical model] confirms to some extent the view that, *ceteris paribus*, foreign competition is a less reliable constraint on the market power of domestic firms than is domestic competition. Consequently, in merger analysis, while transnational market definition may certainly be appropriate, it should be used with due regard for its possible fragility.

Ordoover and Willig, *Perspectives on Mergers and World Competition*, Antitrust and Regulation, 201, 216 (R. Grierson, ed. 1986).

B. Recent Patterns of Imports of Calcium Hypochlorite and Isocyanurates and Their Significance in Determining the Relevant Geographic Market in this Case

331. Data on imports of calcium hypochlorite into the United States are published by the United States Department of Commerce (the "DOC"). (CX 684; Kugelman, Tr. 1262) The DOC data are considered a reliable source of information on calcium hypochlorite imports. (Marcum, Tr. 4179#)

332. Isocyanurates are included in a T.S.U.S.A. category which also includes cyanuric acid as well as its chlorinated derivatives, trichlor and dichlor, namely isos. (CX 179-Z19) Because the DOC import data do not break out isos separately, they are less useful than is the case with the data on calcium hypochlorite imports. (Marcum, Tr. 4179#)

333. Some industry members, including Olin and Monsanto, also attempt to ascertain information on imports from a data base used by *The Journal of Commerce*. (Marcum, Tr. 4006-07; Turnipseed, Tr. 7690-95) *The Journal of Commerce* data, however, are not relied upon by the DOC as a source of import statistics. (Kugelman, Tr. 1262-63) Mr. Marcum of Monsanto acknowledged he has "some difficulty" with [76] *The Journal of Commerce* data (Marcum, Tr. 4176#), particularly with instances of double counting (Marcum, Tr. 4177#) and monthly inconsistencies. (Marcum, Tr. 4178) FMC also did not view *The Journal of Commerce* data as particularly accurate. (CX 478-Z11)

334. The record reflects that Olin relied on information from *The Journal of Commerce* to form its perception of the extent of imports of isocyanurate products into the United States. (RX 83; RX 84; RX 102; RX 103; RX 116; RX 117; Turnipseed, Tr. 7695#) Such data were also used for the purpose of developing information in support of Olin's position in the on-going anti-dumping proceeding before the United States International Trade Commission. (Turnipseed, Tr. 7703#)

335. The evidence is clear that the most significant source of imported cal hypo has been Japan. (CX 176-W-X; CX 684) DOC import data on Japanese imports of cal hypo reveal the following trend (data are in pounds of imported product):

1979	4,031,900
1980	5,122,500
1981	6,895,471
1982	6,975,024
1983	10,842,610
1984	8,402,963
1985	7,051,713

(CX 684-B, D, F, H, J, L, S)

336. PPG, one of the major domestic producers of cal hypo, # # (CX 552-E#) Olin and PPG projected that cal hypo imports from Japan are unlikely to increase in the future. (CX 471-Z9#; CX 548-S)

337. Imports of cal hypo are subject to a tariff of 2.4%. (CX 176-V-W) Imports of isocyanurates are subject to a tariff of 3.5%. (CX 179-Z19-Z20)

338. In this proceeding, data on exports of isocyanurates from Japan into the United States have been obtained from the Japanese producers of isos, Shikoku, and Nissan, which ship products to the United States. (CX 236#; CX 237#; CX 674#) [77]

339. The data from Shikoku show that # # (CX 583-B#; CX 674-D#) # # (Ishida, Tr. 999#, 1006; Pettoruto, Tr. 1395-96#)

340. The data from Nissan show that its United States exports of isos # # (CX 236-H#; CX 237-H#) Most recent data from Nissan, for the first half of 1986, # # (CX 236-H#; CX 237-H#) # # (CX 242-B#; CX 676-Z128-Z29, Z206-Z07#)

1. Isos and Cal Hypo Are Produced and Sold on a National Basis

341. The evidence clearly shows that isos and cal hypo are produced and marketed on a national basis. The domestic manufacturers of isos and cal hypo market isos and cal hypo nationally and compete on a national basis.

2. Although Substantial Quantities of Imported Isos and Cal Hypo Are Sold in the United States, the Other Evidence Clearly Negates a World Market for the Purposes of this Case

a. *The Evidence Does Not Show a World Market*

342. The evidence does not show that isos and cal hypo are produced and marketed on a worldwide basis or that leading domestic and foreign producers compete for the sale of isos and cal hypo on a worldwide basis. [78]

b. *The Recent ITC Dumping Proceedings Involving Imported Isos and Cal Hypo Suggest that Past Import Data May Overstate the Significance of Imports*

343. One type of restraint on foreign competition that is less severe than a quota is an anti-dumping duty order. Testimony concerning the nature and effect of anti-dumping orders and the DOC procedures in conducting administrative reviews of anti-dumping orders was given by John R. Kugelman, a supervisory import compliance specialist with the DOC's International Trade Administration. (Kugelman, Tr. 1229-1301) Mr. Kugelman has some 12-13 years of experience in the review of anti-dumping orders. (Kugelman, Tr. 1231-32)

344. An anti-dumping proceeding is typically initiated upon a petition filed by a representative of the domestic industry allegedly affected by the dumping. An anti-dumping duty order is issued as a result of a bifurcated administrative process involving the DOC and the United States International Trade Commission (the "ITC"). Before an anti-dumping duty order is issued, the DOC must find sales by a foreign producer in the United States at less than the price in that foreign producer's home country (defined, in the parlance of the Tariff Act and applicable regulations, as "sales at less than fair value"), and the ITC must find material injury to a domestic industry as a result of imports of a particular product from a particular country. (Kugelman, Tr. 1233)

345. The effect of an anti-dumping duty order is to require the importer of record to file a cash deposit with the United States Customs Service equal to the amount of estimated anti-dumping duties contained in the order along with other applicable tariffs or duties. (Kugelman, Tr. 1235-36) The product covered by such an order will not be released by Customs for import into the United States until the applicable anti-dumping duties are paid. (Kugelman, Tr. 1237)

346. Periodic reviews of anti-dumping duty orders under Section 751 of the Tariff Act are conducted annually upon request, beginning with the anniversary date of the anti-dumping duty order. The first annual review of an anti-dumping duty order will generally not be completed until twenty-five months after the initial order was issued. (Kugelman, Tr. 1241-42, 1246) However, a procedure for accelerated review of anti-dumping duty orders provided under Section 736 of the Tariff Act allows for a posting of bond in lieu of a cash deposit

pending [79] the completion of the review. Normally, a cash deposit is required. (Kugelman, Tr. 1240)

347. Anti-dumping duty orders can be revoked only on a company-by-company basis. (Kugelman, Tr. 1248) In order to have an anti-dumping duty order revoked or set aside, an importer must demonstrate (1) two years of no sales at less than fair value or four years of no imports and (2) no likelihood of resumption of sales at less than fair value in the future and the firm seeking such a revocation order must agree in writing not to sell below fair value in the United States in the future. (Kugelman, Tr. 1248-50) The minimum time required before an anti-dumping duty order could be revoked is about 3 ½ years. (Kugelman, Tr. 1259) Typically, that time in practice has been 6 to 8 years. The oldest anti-dumping order still in effect dates back to 1964. (Kugelman, Tr. 1260)

348. After an order is revoked, the anti-dumping procedure could be reinstituted by the filing of a petition by a representative of the affected domestic industry. (Kugelman, Tr. 1252-53) Reinstating an anti-dumping duty order would not require a new injury investigation by the ITC. (Kugelman, Tr. 1257)

349. No sales-below-fair-value for a period of two years would require a finding of zero or *de minimis* margins for two consecutive administrative reviews covering two full years. (Kugelman, Tr. 1248-49, 1251, 1289) If a first annual review period showed zero or *de minimis* margins and a second annual review period showed margins, then the two-year clock for revocation purposes would re-commence.

350. In order to comply with the requirements of an anti-dumping duty order, the firm subject to the order must adjust its pricing so that its United States price is not below its home market price or the cost of its home market sales. (Kugelman, Tr. 1299) One way for a firm to avoid dumping duties is to simply raise its United States price. (Kugelman, Tr. 1300) Often firms are able to comply by combining the lowering of the home market price and raising of the United States price. (Kugelman, Tr. 1300)

351. The impact of anti-dumping duty orders against a number of Japanese producer/exporters of isos and cal hypo as the result of ITC dumping proceedings will be treated in greater detail in our later discussion of the significance of isos/cal hypo imports from Japan in evaluation of the market share information. See F. 585-631, *infra*. [80]

c. *Exchange Rates*

352. Changes in exchange rates are obviously an important factor in assessing the extent to which foreign producer-exporters to the United States will be able to influence competition in the United States market. *DOJ Guidelines* § 3.23. This factor will also be discussed further in the later sections. See F. 632-40, *infra*.

d. *Capacity, Costs and Other Constraints of Foreign Producer-Exporters*

353. It is also recognized that the extent to which a foreign producer-exporter will be able to influence competition in the United States market is subject to such other constraints as their production capacity, production costs and the nature and extent of commitments to their respective domestic markets and to non-United States export markets. These factors will also be discussed further in the impact of imported isos and cal hypo in the United States market. See F. 641-48, *infra*.

354. It suffices here to say that the record as a whole clearly shows that the appropriate geographic market in which to assess the competitive effects of the challenged acquisition is the United States and that, in any event, the significance of imports of isos and cal hypo from foreign producers must fully be taken into account in the ultimate assessment of true competitive effects of the challenged acquisition.

VI. THE EFFECTS OF THE CHALLENGED ACQUISITION

A. *Structure of the Market—Producers and Sellers of Isos and Cal Hypo*

1. Domestic Producers

a. *Olin—Isos and Cal Hypo*

355. At the time of the acquisition, Olin was a major producer and seller of both isos and cal hypo. Olin produced isos at the Lake Charles, Louisiana facility and cal hypo at its Charleston, Tennessee plant. The Charleston plant was capable of producing # # pounds per year for pool chemical use, as an industrial cleanser ingredient and water treatment product. (CX 144-J#) [81]

356. At the time of the acquisition, Olin's Lake Charles trichlor plant was the third largest iso manufacturing operation in the United

States and the fourth largest worldwide. (CX 652-A-B#) Olin's PACE brand was the second most popular isocyanurate pool sanitizer in the United States. Olin also has marketed iso pool sanitizers under the ProChlor, Constant Chlor and OCI brand names. (CX 439-A-B#) OCI was a trichlor brand sold in bulk to repackers.

357. Olin's annual isocyanurate production, in thousands of pounds, at its Lake Charles facility for the years 1980 to 1984 was:

<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
#				#
#				#

(CX 441-E-I#)

The 1984 production of # # pounds given here was achieved in a seven-month period from January to July 1984. (CX 441-O#) Projected to a full year, Olin's 1984 production would have been # # pounds.

358. As originally designed and built by Olin, the Lake Charles isocyanurate operation consisted of four facilities: a cyanuric acid plant, a trichlor plant, a dichlor plant and a packaging plant. (Henske, Tr. 7107)

359. According to Mr. Henske, Olin's chairman and CEO, Olin's primary interest in becoming an isocyanurate producer was to market isos as pool chemicals. (RX 35-P#; Henske, Tr. 7103-04) In that regard, Mr. Henske characterized *trichlor* as # # (Henske, Tr. 7125-27#)

360. Olin designed the *trichlor* plant to have a production capacity of # # pounds. (CX 267-A#; Kosche, Tr. 8297) A # # pound cyanuric acid plant was also designed and intended to supply the requirements of both the trichlor and dichlor plants at Lake Charles. (Turnipseed, Tr. 7482; Kosche, Tr. 8297-98) The dichlor plant was described as a # # by Mr. Henske. (Henske, Tr. 7114#) It's design capacity was relatively small, in the range of # # pounds. (Henske, Tr. 7114#, 7227#; Kosche, Tr. 8354#) [82]

361. According to Mr. Henske, most of the emphasis on Olin's pilot plant work concerned the *trichlor* production process which began in 1973. (RX 35-F#; Henske, Tr. 7106) The trichlor pilot plant was operated for three to four years before the decision was made to build a product plant on a commercial scale. (Henske, Tr. 7106) On the other hand, the dichlor plant was piloted on a "very modest scale." (Henske, Tr. 7107, 7229)

362. Olin's Capital Appropriations Request ("CAR") for the construction of its Lake Charles facility, which was approved in mid-1977, provided for # # (CX 876-A-B#) The CAR encompassed a 1977-1989 planning period, and was based on the assumptions that (1) the iso segment of the pool chemicals business would grow at # # % per year (CX 876-A#), (2) # # (Kosche, Tr. 8615-22#), and (3) iso supply would exceed demand by about # # % per year. (RX 35-C#) By 1979, it became clear that spending would be higher and market growth slower than had been anticipated in the 1977 CAR, and the capital spending committed to the project was raised to # # an increase of # # %. (CX 876-A#; Kosche, Tr. 8622-23#) Plant construction on all four facilities was completed in late 1979, and by the end of that year, Olin was manufacturing isocyanurates at its Lake Charles plant. (CX 476-F#; RX 35-B#; Kosche, Tr. 8297-98#)

363. By 1982, events disproved additional assumptions of Olin's 1977 CAR. First, FMC, a competing iso producer, had begun pursuing an aggressive iso brand marketing strategy with its SUN brand. Second, iso supply was actually about # # in excess of demand, primarily because the Japanese producers had expanded their combined capacities substantially above what Olin had projected (RX 35-C#) and this, in turn, depressed iso prices # # below the 1977 CAR projections. (RX 35-C#) Third, production problems at the iso facility had caused total capital spending to reach # # (RX 35-B#)

364. From the beginning of iso plant construction in 1977 through the 1980-1982 plant start-up/market development phase, Olin # # (CX 267-M#)

365. As Olin stated in June, 1983 to ITC, # # (CX 750-Z32# [a certified questionnaire form submitted to ITC in the iso dumping proceeding]; Kosche, Tr. 8660-63#)

366. Olin's 1982-1991 PACE (iso) Strategic Plan, prepared in mid-1982, stated (CX 267-A#): [83]

#

367. A substantial portion of Olin's 1980-1982 start-up costs involved the cyanuric acid facility. (Kosche, Tr. 8665#) As Olin told the ITC, the cyanuric acid plant # # (CX 750-Z32#; Kosche, Tr. 8665#) # # (CX 475-N#; Henske, Tr. 7115#) According to Mr. Kosche, the cyanuric acid plant was shut down because of # # and the shutdown decision was justified because Olin had # # (CX 475-N#)

368. Olin's packaging facility # # (Kosche, Tr. 8365-66#)

369. # # (Kosche, Tr. 8352-54#) The plant, however, did become operable and, as far as Mr. Henske was concerned, achieved its design capabilities. (Henske, Tr. 7227-28#)

370. Olin's dichlor plant was ultimately shut down in May, 1982 # # (CX 174-Z157#; Kosche, Tr. 8589#) # # (CX 174-Z157#) # # (CX 174-Z158#)

371. The trichlor plant also experienced start-up difficulties, but they were successfully overcome. (RX 35-B#; Kosche, Tr. 8339-40) By the end of 1981, the trichlor plant had [84] demonstrated its ability to produce at its design capacity. (RX 35-B#) Olin had spent about \$12 million in start-up costs on the two iso plants. (Kosche, Tr. 8340-41)

372. In April, 1980, during the start-up phase of the Lake Charles trichlor plant, # # (RX 10-B#; Kosche, Tr. 8631-32#) The plant's "cyanuric acid conversion rate" was # # (Kosche, Tr. 8631#) Olin's 1983 pool chemicals budget, which was prepared in the fall of 1982, treated the effective cyanuric acid conversion rate at Lake Charles as # # (CX 502-M#; Kosche, Tr. 8679-80#)

373. Olin's entry into isos production was premised on a branded marketing strategy. (RX 35-Q#) Olin's 1977 isocyanurate facility CAR did not contemplate iso sales to repackers. (RX 35-C#) By 1980, Olin was contemplating bulk sales to repackers to "base load" the Lake Charles plant, *i.e.*, to keep the plant operating at the highest practical rate. (CX 264-B#) Beginning with the 1980 pool season, Olin marketed its isocyanurates nationally as pool sanitizers under the PACE brand name. (CX 264-A#; Kosche, Tr. 8311)

374. Olin pursued # # (CX 264-B#) and intended to establish PACE as the leading national iso brand and a premium-priced brand. (CX 260-F#; CX 264-B#) During the early 1980's Olin undertook to achieve its PACE marketing goals with # # promote and advertise PACE. (CX 264-B-C#; CX 750-Z32#; Kosche, Tr. 8659#)

375. Olin's marketing strategy for PACE was to sell it through all types of retail outlets including pool stores, mass merchandisers, hardware stores, garden supply stores, grocery stores and drug stores. Olin sold PACE through nonexclusive distributors and also directly to retailers. (CX 259-Q) Olin's distribution strategy met with some resistance from pool dealers who preferred not to carry brands that were also available in discount operations. (CX 260-G#; Castagnoli, Tr. 2485-86; Vonderlow, Tr. 4787#)

376. Olin's ability to # # was a factor taken into consideration by

Olin's planners. (Fortuna, Tr. 8237#) Olin documents show that # # (CX 268-C#)

377. Olin's 1983 Consumer Products Group Strategic Plan [85] provided as "Operating Guidelines" for Olin's "Growth" isocyanurate business: # # (CX 259-F#) By March, 1983, Olin had improved its cyanuric acid conversion rate at the trichlor plant from # # (CX 502-S#; Kosche, Tr. 8678-79#) In fact, the plant achieved a conversion rate # # (CX 863-D#) Olin's CA conversion rate of # # Based on its internal analyses, Olin concluded that # # (CX 259-P#; CX 502-S#) And Olin representatives acknowledge that Olin was a # # (CX 656-Z14-15#; Swartley, Tr. 7061-63#; Henske, Tr. 7199-7200#) Olin also was # # (Kosche, Tr. 8546#)

378. A March, 1983 PACE business update concluded that # # (CX 269-C#) # # (CX 269-Z2#) Other Olin cost comparisons show # # (CX 259-R#) # # (CX 263-M, V#) In August, 1983, Olin concluded that # # (CX 749-A#) FMC recognized Olin as the most efficient iso producer (CX 61-V) and # # (RX 310-D#; Marcum, Tr. 4203-04#)

379. During the 1983-1985 period, Olin successfully increased the practical production capacity of its trichlor plant beyond the facility's design-rated capacity. By February, 1983, Olin # # (CX 269-O#) By the second quarter of 1985, # # (CX 441-J#)

380. Olin's PACE sales also grew steadily throughout the 1980-1984 period. Olin gained market share in isos # # (CX 179-Z8; CX 219-A#; CX 220-A#) In 1982, # # (CX 498#) In 1984, the PACE sales volume # # (CX 832-A#; Fortuna, Tr. 8145#)

381. In the marketplace, Olin established PACE as one of the only two national brands of iso sanitizers, the other being FMC's SUN brand. [86]

382. Olin was, and still is, the only domestic iso producer vertically integrated in urea, an important input material for the production of cyanuric acid. (CX 375-P, R#) FMC viewed Olin as having the best raw materials position of any isos producer because of its vertical integration in urea, chlorine, and caustic soda, the three key input materials for CA production. (CX 664-Z23#) Prior to the acquisition, Olin believed # # (CX 749-A#) After the acquisition, Olin became the only fully vertically integrated producer selling isos in the United States, producing internally all of the input materials required for the production of isocyanurates.

383. During the trial of this case, Olin expended much trial time and

efforts to develop a detailed and extensive record designed to show that (1) the CA production technology employed by Olin at Lake Charles had not been tested and employed successfully theretofore on a commercial scale by any producer anywhere in the world and it proved to be an uneconomical CA production process, a costly and long-drawn lesson to be learned by Olin before it decided to shut down its CA plant in the spring of 1981; (2) Olin's dependence on purchased CA (from Nissan of Japan) placed Olin under a serious cost disadvantage as a producer-seller of isos; (3) Olin's trichlor and dichlor production plants also encountered a series of unexpected and costly technical difficulties, until Olin decided to "waterbatch," for the time being, the entire iso production facilities at Lake Charles in July, 1984, thereafter becoming a repacker-seller of Monsanto-tolled isos. See RPF at 81-137. Olin now argues that for these reasons it was never a viable competitor in the United States isos market and sustained enormous financial losses from its Lake Charles venture before it acquired FMC's CA/iso production technology assets and business in 1985. See RB at 91-96.

384. The evidence also shows that, after Olin suspended its trichlor production at the Lake Charles plant, Olin continued to be a major contract producer-seller of isos (PACE brand) through its raw materials tolling agreement with Monsanto ("Monsanto Toll") (CX 469#), which obligated Olin to take # # pounds of isos per month from Monsanto. (CX 469-C#)

385. Thus, the record as a whole demonstrates that, although Olin lacked its own cyanuric acid (CA) supply, had to depend on purchased CA, and ceased to produce isos by late summer of 1984, Olin was a committed, viable and major producer-seller of isos up to the time Olin commenced the FMC acquisition negotiations in earnest. [87]

386. Olin entered the production of cal hypo in 1928, and in the same year introduced the HTH brand pool sanitizer. At the time of the acquisition, Olin's calcium hypochlorite facility in Charleston, Tennessee, was the largest cal hypo manufacturing operation in the world. The annual cal hypo production capacity of the Charleston plant was # # at the time of the acquisition. (CX 441-J#) Mr. Turnipseed, addressing the ITC in May, 1984, remarked that "Olin sells most of its calcium hypochlorite in the residential swimming pool market." (CX 173-K)

387. Olin also owns a chemical plant in Niagara Falls, New York, where it produced cal hypo until September, 1982. (CX 384-D#)

Robert Yohe, President of Olin's Chemicals Group, testified on May 14, 1985, # # (CX 473-A, D, I-J)

388. The cal hypo # # (CX 441-E-G#) Olin's annual cal hypo production, in thousands of pounds, for the years 1980-1984 was as follows:

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	
Charleston#						#
Niagara#						#

(CX 377-Z15#; CX 384-F#; CX 441-E-I#)

389. Olin is also the 50% owner of a cal hypo production facility in Johannesburg, South Africa. The facility is operated under the joint venture named Aquachlor Pty. Ltd. The plant opened in 1974 and has an annual cal hypo # # (CX 441-D#) Aquachlor does not export to the United States.

390. Olin periodically assesses the manufacturing costs of other cal hypo producers and has # # (Henske, Tr. 7243#) # # (Hughes, Tr. 5250#) Mr. Henske acknowledged that Olin is the leading producer of cal hypo and has the # # of the cal hypo business in this country. (Henske, Tr. 7156#, 7168#) [88]

391. PPG acknowledges Olin's leadership position in the cal hypo business. (CX 545-D; CX 548-H; CX 549-C) PPG's Richard Hughes estimates that Olin has historically had over # # of the domestic cal hypo business and that Olin's HTH accounts for # # of branded cal hypo sales. (Hughes, Tr. 5353-54#) Toyomenka, a leading importer of Japanese cal hypo, also acknowledges Olin's dominant position as a supplier of cal hypo in the United States. (CX 613-A#) Pool sanitizer repackers consider Olin to be the leading marketer of cal hypo. (Marshall, Tr. 1156-57#; Schaub, Tr. 2097-98; Castagnoli, Tr. 2532)

392. Olin is acknowledged to be the pricing leader in cal hypo. (CX 119-L; CX 173-Z35, Z44-45; CX 175-Z58; CX 360-A#; Castagnoli, Tr. 2532) Typically, Olin's pricing lead is followed by PPG. (CX 360-A#) Also, Olin's HTH brand of cal hypo commands a premium price in the marketplace. (CX 173-O; CX 175-W; CX 660-C#; Hughes, Tr. 5304#; Henske, Tr. 7156#)

393. Increased cal hypo prices in the 1979 to 1981 period were led by Olin, with others following. (CX 175-Z70) # # (CX 647-B#) # # (CX 499-M#; CX 545-B)

394. Olin typically announces its cal hypo prices for the following pool season on October 1 of each year. (CX 175-Z2) This has been

recognized as reflecting annual increase in cal hypo prices which are surely to be followed by others. (CX 377-Z26#)

395. In 1984, Olin announced two cal hypo prices, the first in May, 1984, less than one month after the ITC iso anti-dumping decision. (CX 113-C) Later in 1984, Olin led a second cal hypo price increase, which met with little resistance. (CX 312#; CX 361-B; CX 482#)

396. Shortages of cal hypo were reported in April and May of 1984, around the time of the first 1984 cal hypo price increase, and Olin put customers on allocation, at a time when Olin had substantial excess capacity. (CX 382-Z7; CX 383-I-J)

397. In order to support and promote its HTH sales Olin has used a number of programs. Olin employs national advertising, including network television (CX 481-F#), provides cooperative advertising and distributor incentive programs for its customers (CX 176-Z14-15). Olin publishes the Poolife magazine with a circulation of 1.2 million that provides advice and information on a variety of topics of interest to pool owners and contains discount and rebate coupons for HTH and other Olin [89] brands. (CX 481-F#) Olin also employs dealer incentive programs that enable dealers to earn vacation trips based on high sales volumes. (CX 481-F#; Marshall, Tr. 1164-65)

398. Thus, Olin is indisputably the industry leader in the production and sale of cal hypo for pool use in the United States. And, in the dry pool chemicals market comprising isos and cal hypo Olin was one of the top firms, if not the leading firm, in this country.

b. *FMC Corporation—Isos*

399. At the time of the acquisition, FMC's South Charleston, West Virginia isos plant was the second largest isocyanurates manufacturing operation in the world. (CX 652-B#) The South Charleston isos plant was part of FMC's CDB business and included facilities for producing the two isocyanurate products, trichlor and dichlor, and also a facility for producing cyanuric acid. (CX 64-Z33-34; Collins, Tr. 3829) FMC began iso production at South Charleston with a single dichlor line in 1963. In 1969, FMC opened a second dichlor line and in 1974 added the trichlor line. (CX 64-Z33) In 1983, FMC completed the modification of a dichlor line to swing between production of dichlor and trichlor.

400. At the time of the challenged acquisition, the practical annual capacity of FMC's isocyanurate production facilities was as follows:

400

Initial Decision

	<u>Annual</u> <u>Production Capacity</u> (million pounds per year)
Dedicated dichlor line	17
Dichlor swing line	16
Total maximum dichlor capacity	33
Dedicated trichlor line	13
Trichlor swing line	10
Total maximum trichlor capacity	23

(CX 64-Z33-34)

And, FMC's annual isocyanurate production (in thousands of [90] pounds) for the years 1980-1984 was as follows:

<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
24,100	33,000	35,200	32,000	36,000

(CX 64-Z37)

FMC marketed isocyanurates for pool use under the SUN brand and operated a repacking facility in Livonia, Michigan. (CX 64-Z25)

401. Prior to 1978, FMC produced and sold bulk isocyanurates to pool chemical repackers under the "CDB" trademark and bulk dichlor to industrial accounts under the "Clearon" trademark. (CX 278-Z7#)

402. FMC entered the branded distribution of isocyanurate pool sanitizers in 1978 when it acquired the Sun Cleanser Company, a large regional isocyanurate repacker that marketed isos under the SUN brand name. (Collins, Tr. 3570) Thereafter, FMC undertook a major advertising and promotional campaign to establish SUN as a national brand. This strategy was designed to achieve market share growth. (Collins, Tr. 3794)

403. According to John Christensen of Chem Lab, # # (Christensen, Tr. 1810#) Mr. Christensen believed that aggressive pricing was # # (Christensen, Tr. 1811#) He characterized the iso pool chemical situation on the west coast several years ago as a # # (Christensen, Tr. 1810#) Charles Schaub of Coastal, another large repacker, also acknowledged that he purchased isos from FMC because FMC was more competitive than Olin or Monsanto. (Schaub, Tr. 2106)

404. A Monsanto pricing summary document reflects that:

- 1) # #
- 2) # #
- 3) # #

- 4) # # [91]
 - 5) # # and
 - 6) # #
- (CX 191-B, D#)

405. The record reveals several other instances where FMC was exerting downward pressure on pricing. (CX 107-B; CX 108-B; CX 109-B; CX 112-B; CX 215-A; CX 216#; CX 217-A; CX 221-A#) These documents include 1983 (CX 108-B; CX 109-B) and 1984 (CX 221-A#) as well as 1982 and previous years.

406. FMC's efforts to increase SUN's market penetration were successful. In 1979, its first full year of marketing SUN, FMC had established SUN as the leading national isos brand. (Collins, Tr. 3777)

407. In 1979, FMC corporate management embarked on a business restructuring program designed to increase the value of FMC's stock. The program included the development of uniform, corporate-wide standards of minimum acceptable financial performance to be used to identify, and to either shut down, liquidate or sell, those business units with substandard performance without a reasonable prospect of meeting the standards. (Furrer, Tr. 3347-48)

408. FMC's measures of financial performance to judge its business units under the corporate restructuring program included ROI (return on investment), CFROI (cash flow return on investment as an inflation-adjusted version of ROI), ROWC (return on working capital, used in determining ROI), and ROCE (return on capital employed, used in determining ROE (return on equity)). John R. Furrer, FMC's Vice President of Corporate Development, who headed the business restructuring program, testified that FMC regarded CFROI to be "the most important of all." (Furrer, Tr. 3348-50, 3493)

409. FMC's corporate planning department established the following corporate "hurdle rates" for three of the above-listed measures:

Return on working capital (ROWC)—15%
Return on capital employed (ROCE)—15%
Cash flow return on investment (CFROI)—9% [92]

Mr. Furrer testified that these hurdle rates were to be measured uniformly on a historical cost basis. If measured on a current cost basis, the ROCE corporate hurdle rate would be about 7%. The ROWC and CFROI hurdle rates would also be lower when judged on a current cost basis. (RX 134-Z47; CX 29-I; Furrer, Tr. 3458, 3493-94; Collins, Tr. 3693-94)

410. FMC's business restructuring analysis involved two separate tracks. Mr. Furrer and members of his corporate planning staff would meet with the group managers for each of FMC's businesses where the planning staff presented its views about how the business unit measured up against the hurdle rates and the likely future performance of the business. Each business unit was required to respond in its biannual strategic planning process, after which the process moved on to resolve any remaining differences between the corporate planning staff and business unit management, with a view to a determination of whether the business was to be a candidate for liquidation or divestiture under the restructuring program. (Furrer, Tr. 3351-53)

411. In 1980, when FMC completed the review of all of its business units, there were thirty-five business units within the corporation. In 1987, that number had declined to twenty-five business units, primarily due to divestiture of the units pursuant to the corporate restructuring process. (Furrer, Tr. 3346)

412. Under any of the three principal financial measures used by FMC, the CDB business fell below corporate hurdle rates. (Furrer, Tr. 3357-58) Using FMC's internal accounting procedures, the CDB unit had a CFROI of 6.5% in 1978 and 9.3% in 1979. (RX 132-Z1) The CDB business performance was somewhat better when measured by the ROCE or ROWC. Thus, according to FMC's internally established corporate hurdle rates, the CDB business became by 1980 a potential candidate for divestiture unless the management perceived near-term prospects of improvement and a reasonable expectation of attaining hurdle-clearing financial performance.

413. Because of FMC's internal accounting procedures, however, it is not easy to assess the profitability of FMC's CDB business for the purpose of objectively determining the *viability* of FMC's isos business as a going concern. Although FMC, as required by the Securities Exchange Commission ("SEC"), reports its financial results to its stockholders and to the public, under the generally accepted accounting principles on the basis of *historical* cost accounting, FMC internally employed *current* cost accounting. (Collins, Tr. 3721-22, 3906) [93]

414. It is well-recognized that using current cost accounting for measuring profitability uniformly results in lower profits or greater losses than result from the use of historic cost accounting. (Collins, Tr. 3724, 3730-31) Using current cost accounting for measuring ROI

(return on investment) results in uniformly lower rates than result from the use of historic cost accounting. (Collins, Tr. 3726-27, 3731) And, all of the record testimony of Mr. Collins, FMC's CDB Director, regarding the profitability or lack thereof of the CDB business referred to profits based on current cost accounting. (Collins, Tr. 3724-25, 3740, 3780)

415. In any event, about January, 1980, FMC's corporate planning department concluded that improvement of the isos business was unlikely because (1) FMC did not have a good cost position in comparison to the other isos producers; (2) there was significant isos overcapacity; (3) the SUN brand national marketing strategy had alienated its traditional repacker customers; (4) competitive pressure from the Japanese iso exporters and from Olin would have a long-term depressing effect on iso prices; and (5) isos were a commodity chemical. (CX 667-A, B; Furrer, Tr. 3357-60; Collins, Tr. 3583-88, 3619-20) During a subsequent Board presentation by Mr. Furrer, FMC's senior corporate management identified the CDB business as a potential target for divestiture, and Mr. Furrer informed Mr. McMinn, then head of FMC's Industrial Chemicals Group, of the Board's views. Mr. McMinn directed the CDB management to prepare a response. (Furrer, Tr. 3428-29, 3357-58)

416. In its response (contained in the 1980 Strategic Plan) the CDB business management proposed to operate the business for another two years in the maintain-and-selectively-invest mode rather than in the run/sell mode. (RX 125-E, G, H; RX 134-Z36, Z37, Z58; Furrer, Tr. 3357-58; Collins, Tr. 3577-78, 3593-95) The resulting agreement between the corporate planning group and the CDB management, as embodied in the 1980 Master Contract (RX 133-D-F), allowed continued CDB operation under certain operating parameters, including selective capital investment and maximization of short term cash flow.

417. During the 1982 strategic planning process, the CDB business management team identified and reviewed four options to be recommended to the corporate planning group. They were (1) to invest in a new plant using FMC's Sulfolane technology to produce cyanuric acid; (2) to buy Olin's trichlor plant at Lake Charles and build a CA plant; (3) to enter into a joint venture with Olin, including construction of a new CA plant using the Sulfolane technology; and (4) to exit the isos business. (RX 125-P,Q) The CDB management decided to recommend the exit [94] option. (RX 125-B; *see* Furrer, Tr. 3373-74; Collins, Tr. 3625, 3627, 3807-08)

418. FMC's corporate planning department accepted the CDB recommendation. In a memorandum dated September 2, 1982, and addressed to both the President and CEO of FMC, the corporate planning department advised that (RX 380-A): "The Specialty Chemicals Division has recommended that we withdraw from the CDB business. Group management and Corporate Development support this recommendation."

419. Respondent contends that at that point a "final" exit decision had been made by FMC. *See* RPF 412.

420. Although the record reflects that FMC's corporate management evidently decided to sell the CDB business eventually, FMC also decided to continue to operate the business in a mode FMC described as "run/sell." And, in the run/sell mode, FMC continued to make capital investments in the CDB business to improve manufacturing costs and to increase isocyanurate production capacity through debottlenecking. It was recognized that such expenditures would contribute to CDB's profitability and make the business more saleable. (RX 125-Z13, Z18; Collins, Tr. 3819-21)

421. Viewed thus, the 1982 master contract does not reflect a definitive and final exit decision but does define the specific operating strategies under the run/sell mode. (RX 133-A-C; Furrer, Tr. 3482; Collins, Tr. 3828-29) In brief, the 1982 master contract envisioned continued operation of the business within certain parameters until such time as an acceptable sale has been concluded.

422. In his March, 1984 testimony before the ITC's Japanese dumping proceeding, Mr. Collins testified that FMC had reduced capital expenditures and curtailed research and development to minimize the negative impact of Japanese dumping. (Collins, Tr. 3836) Mr. Collins also testified that, if FMC could get some pricing in the right direction, it could make the CDB business into a good business. (Collins, Tr. 3838) During his testimony, Mr. Collins did not say that FMC was considering exiting the CDB business. (Collins, Tr. 3840-41)

423. In August, 1984, a CDB plan update was prepared by the division which analyzed and rejected a shutdown decision. (CX 29-A, F; Collins, Tr. 3844-45) The recommendation of the division was to continue an operating plan of run/sell for the next 18-24 months, at which time the business would be reevaluated. (CX 29-A; Collins, Tr. 3846) This run/sell [95] recommendation was approved and endorsed by corporate management. (Furrer, Tr. 3489; Collins, Tr. 3846, 3856)

424. The highest ranking FMC official to testify in this case, John R. Furrer, Vice President of Corporate Development, stated that he had never seen a corporate document that talked about an irrevocable decision by FMC to exit the CDB business (Furrer, Tr. 3423-31, 3440) and Mr. Collins, the director of the CDB business, testified that at the time the run/sell mode was reaffirmed in the fall of 1984, he would not say it was an irreversible decision. (Collins, Tr. 3863)

425. Furthermore, FMC was not conducting its CDB business in a manner consistent with a decision to shut down or liquidate that business. The 1982 CDB master contract reflects the strategies of increasing capacities, debottlenecking, and cost reduction programs, all of which were implemented. (RX 133-A-C; Collins, Tr. 3828-31) In May, 1985, there was a project at FMC that would expand cyanuric acid capacity at South Charleston by 5 to 10 million pounds. (Collins, Tr. 3868-69)

426. Liquidation of FMC's CDB business would not have been economically attractive because of the relationship of the business' net present value to its liquidation value, and because of the increasing value of continuing to operate the business. Shutdown value is the after-tax present value of going through the process of going out of business. Net present value is the value of a stream of cash flows that are projected to be generated by a business over a period of time and discounted to present value. (Furrer, Tr. 3457-58)

427. At the time of the 1982 shutdown analysis, the net present value of continuing to operate the CDB business was \$9 million (RX 125-Q; Furrer, Tr. 3464), while the net present value of shutting the business down was \$9.4 million. (RX 125-U; Furrer, Tr. 3462) Even though comparable values were derived for continuing to operate the CDB business and for shutting it down, the division recommendation was to operate the business in a run/sell mode. (RX 125-Z18)

428. The next and last shutdown analysis prepared by FMC of its CDB business was in August, 1984. (CX 29; Collins, Tr. 3845-47) FMC's conclusion was that the net present value of continuing to operate the CDB business was \$31 million, while the net present value of shutting the business down was \$15 million. (CX 29-A, I, J) # # (CX 29-A) # [96] # (CX 474-V-W#)

429. The evidence also shows that FMC's plans and prospects for the CDB business were optimistic during 1984 and 1985. The CDB business budgeted its operating profit before tax for 1985 at \$3.6 million. (CX 707-I#) The 1985 budget was approved in November,

1984 by corporate management. (Collins, Tr. 3732) On February 22, 1985, in its April forecast, FMC's CDB business increased its expected operating profit before tax over its 1985 budget from \$3.6 million to \$6.2 million. Virtually all of the increase was attributed to expected price increases for isos and manufacturing efficiencies at the South Charleston plant. (CX 715-A-B) For the first three months of 1985, the CDB business realized an actual operating profit of \$2,784,000, while the April forecast for the period anticipated a lower profit of \$2,557,000. (CX 718-B; Collins, Tr. 3740-41) The director of the CDB business stated that, on either a current cost or historic cost basis, the business showed a trend from the red to the black. (Collins, Tr. 3730) And Mr. Furrer, the only member of FMC's corporate management to testify, stated that the net present value of operating the CDB business was three times greater in 1984 than in 1982. (RX 125-Q; CX 29-A; Furrer, Tr. 3464)

430. At the time of the sale of FMC's CDB business to Olin, FMC expected the profitability of the business to increase. The CDB plan summary prepared in August, 1984 indicated that as business performance improves under current conditions, the business' value as well as its saleability should also improve. (CX 29-A; Collins, Tr. 3845-46) That summary also forecast increasing profits and cash flow for the CDB business, with net profits after tax increasing from \$2.8 million in 1984 to over \$11 million by 1989. (CX 29-I) It also forecast increasing capital expenditures and operating profits greater than cash flow. (CX 29-I)

431. # # (CX 263-C, E, I, S#; CX 405-H#) # # (CX 405-P#; CX 474-V, W#)

432. Between 1980 and the announcement of the sale to Olin, FMC was increasing both the sales and the market share of its CDB business. In 1980, FMC estimated its share of the isos market to be 26.5%. By December of 1984, FMC believed that its share of the market had increased to 37%. (CX 34-L) [97]

433. From 1983 to 1984, FMC projected an increase in its market share of the SUN/repacker volume from 29% to 40.5% while reducing advertising and selling expenses. (CX 70-Q) This increase was at the expense of importers. (CX 70-T) For the same period, FMC projected an increase in its market share of its total iso volume from 38% to 44% at the expense of importers. (CX 70-S)

434. However, the evidence also shows that the continued operation of the CDB business in the "run/sell" mode after 1982 within the

parameters defined in the master contract also meant that, in addition to limiting capital expenditures, FMC's iso marketing efforts had to be scaled down substantially from the previous levels. A number of former FMC/CDB isos customers testified that FMC's promotional and cooperative advertising programs, as well as FMC's brand and dealer support declined noticeably from late 1982 through 1984. *E.g.*, Aston, Tr. 4433-36, 4438-40, 4445; Vonderlow, Tr. 4800, 4842-44; Benson, Tr. 4922-23#; Roberts, Tr. 5056-58; Wetzel, Tr. 5386-88; Kent, Tr. 6545-50; Russ, Tr. 5666; Arakelian, Tr. 5889-90, 5950-51.

435. Also, in December, 1984, before FMC signed the Letter of Intent with Olin, FMC wrote off the CDB assets, along with four or five businesses, and took a \$167 million charge against corporate earnings. FMC knew that had it continued any of these written-off businesses, it would incur substantial tax penalties. (Furrer, Tr. 3416-19)

436. In 1983, following the "run/sell" decision, FMC undertook relatively limited efforts to sell the CDB business, claiming at trial that as a practical matter, a general economic downturn at that time made an extensive buyer search unnecessary. (Furrer, Tr. 3382-84)

437. During the 1984 strategic planning process, FMC reassessed the CDB business. (CX 29#; Collins, Tr. 3845) The 1984 CDB Strategic Plan, completed in August, 1984 and subsequently approved by FMC's corporate management, concluded that: # [98] # [CX 29-A#; Furrer, Tr. 3489; Collins, Tr. 3844-46)

438. FMC was acknowledged to be a less efficient producer of trichlor than either Monsanto or Olin. (CX 749-B#; RX 132-V#) FMC's trichlor conversion rate was estimated to be in the # # (RX 132-V#) FMC was, however, acknowledged to be a more efficient producer of dichlor than Monsanto. (CX 749-B#; RX 132-Q#) Hence, FMC was able to reduce costs by swapping CA or dichlor for trichlor with Olin. (CX 174-Z157#; CX 519#; CX 520#; CX 521#; CX 523#; Collins, Tr. 3825-26, 3870)

439. FMC's isocyanurate business assets included its 50% interest in Chlor-Chem, Ltd., a British company with a facility, located at Widnes, England, that produced dichlor, trichlor and cyanuric acid. (CX 179-Z39; CX 465-J) Chlor-Chem was a joint venture in which FBC Holdings Ltd. owned the other 50% share. (CX 179-Z39; CX 256-H; Furrer, Tr. 3526-27) FBC is owned by Schering AG. (CX 450-Z1#)

440. Chlor-Chem began producing isocyanurates in 1972. Its annual isocyanurate production capacity, at the time of the acquisition, was

approximately # # pounds. (CX 64-Z23#) Chlor-Chem was reportedly the largest European isos producer. (CX 27-B) Chlor-Chem had been producing # # (CX 64-Z24#)

441. Since the formation of the Chlor-Chem joint venture, FMC had exclusive marketing control over all Chlor-Chem isocyanurates sold outside the United Kingdom. (CX 64-Z20#) On occasion, FMC has imported small amounts of isocyanurates from Chlor-Chem to the United States. The total such imports (in thousands of pounds) for the years 1980-1984 were as follows:

<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
0	723	33	0	42

(CX 64-Z22)

442. Chlor-Chem produced cyanuric acid utilizing dry pyrolysis technology and supplemented its internal production with CA purchased from Nissan of Japan and CdF of France. (CX 64-Z21; Kitagawa, Tr. 2392-94#) [99]

c. Monsanto Company—Isos

443. At the time of the acquisition, Monsanto's isos plants—a dichlor plant in Luling, Louisiana, and a trichlor plant in Sauget, Illinois—represented the largest isocyanurates manufacturing operation in the world. (CX 232-Q-R, T; CX 652-B#; Marcum, Tr. 3951#) Monsanto has been a producer of isocyanurates since the late 1950's. Monsanto also manufactures crude cyanuric acid at the Luling plant. (Marcum, Tr. 3950-51)

444. Monsanto formerly sold granular CA for use as a pool water stabilizer. Since late 1984, however, Monsanto has used its entire CA capacity for internal use as the principal ingredient of the trichlor and dichlor it produces. (Marcum, Tr. 3949-50) Monsanto's cyanuric acid conversion rate at its Sauget trichlor plant is # # At the time of trial, Monsanto's cyanuric acid # # (Marcum, Tr. 4053, 4068#)

445. Monsanto does not produce all its raw material requirements for iso production, but buys chlorine and caustic soda. (CX 664-Z22; Collins, Tr. 3816-17) Monsanto also buys urea for CA production. (Marcum, Tr. 4053#)

446. Approximately # # of Monsanto's trichlor output is sold as pool sanitizers and # # of its dichlor output is sold for the same end-use, with the remainder being used for industrial applications. (Marcum, Tr. 4055#) Approximately # # of Monsanto's total isos output is exported, with that percentage # # (Marcum, Tr. 4057#)

447. Monsanto sells isocyanurates exclusively in bulk form to repackers and industrial accounts. The company has never sold its isocyanurates directly to distributors or dealers. (Marcum, Tr. 3961-63, 3966-67) Monsanto's isocyanurate business is designated its ACL business, and it sells bulk isocyanurates to repackers under the "ACL" trademark. ACL 90 is the Monsanto bulk trichlor product, and ACL 56, ACL 59 and ACL 60 are its bulk dichlor products. (CX 232-W, Z2; Marcum, Tr. 3948, 4118-19)

448. Monsanto's annual isocyanurate production, in thousands of pounds, for the years 1980-1984 was as follows:

<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
31,579	33,069	27,351	30,732	48,718

(CX 232-Q-R) [100] At the time of the acquisition, Monsanto's annual isocyanurate production capacity was # # pounds. The Luling dichlor plant had a # # pound capacity and the Sauget trichlor plant had # # pounds of capacity. (CX 232-W)

449. In the pool chemicals business, Monsanto is recognized as the price leader of isocyanurates sold in bulk to domestic repackers. (CX 75-D#; CX 240-G#; CX 677-Z19#; Pettoruto, Tr. 1376#) Many in the industry also recognize Monsanto as the supplier that has generally attempted to increase bulk isocyanurate prices. (CX 9-H, M, Z21, Z32; CX 107-B; CX 117-B; CX 132-A; RX 127-Y#; Bloom, Tr. 712; Christensen, Tr. 1815#; Collins, Tr. 3806-07) Monsanto's high price policy is regarded as "firmly entrenched." (CX 9-Z32)

450. Mr. Marcum of Monsanto testified that # # (Marcum, Tr. 4190#) A Monsanto September, 1983 pricing recommendation memo acknowledged that Monsanto had # # (CX 218-A#)

451. In the fall of 1983, while iso prices were actually declining, Monsanto announced that its 1984 price would remain unchanged from the 1983 level. (CX 218-A#) In September, 1984, Monsanto announced a 15 cent per pound iso price increase (from \$1.30 to \$1.45) for the 1985 season, which was followed by both the domestic producers and the Japanese importers. (CX 222-A#; CX 223-A#) On July 25, 1985, Monsanto's ACL managers decided on a 15 cent increase in iso prices (from \$1.45 to \$1.60) to be publicly announced in September, 1985 for the 1986 season. (CX 223-A#) By early August, Monsanto's customers and at least one competitor had learned of Monsanto's planned price increase. (CX 132-A; CX 565-A) Monsanto's September, 1985 increase became the industry list price for 1986. (CX 448-C; CX 449-A; Jonas, Tr. 2246#; Marcum, Tr. 4118-19#)

452. Monsanto's iso salesmen are not seen as highly involved with the pool chemical business; they are not pool chemical specialists, but rather are responsible for several other non-pool chemicals manufactured by Monsanto. (CX 9-H; Wilson, Tr. 4263)

453. Monsanto is perceived to have a cost advantage over other isos producers in terms of cyanuric acid production costs. (CX 34-X; CX 259-P#; CX 502-S#; CX 664-Z22; RX 32-M#) However, Monsanto's cost advantage may be offset to some extent by Monsanto's multiple locations for iso production. (CX 664-Z22) [101]

454. Monsanto has been plagued by production problems (CX 570-D#; CX 571-C#; CX 604-B; CX 615-A#; Marcum, Tr. 3954, 4036) and product quality problems. (CX 174-Z1-2, Z173#; CX 179-Z7; CX 515#) Monsanto is perceived to have been losing market share to Olin and FMC. (CX 9-Z21-22; CX 179-Z8, Z24; CX 219-A#; CX 220-A#; Marcum, Tr. 4049)

455. Monsanto is perceived by some to lack a strong commitment to the iso business. (CX 9-V) In 1982, FMC perceived Monsanto to be # # its isos business. (CX 462-D#)

456. Monsanto's ACL business suffered a decline in its annual sales volume during the period 1979-1982 # # (CX 225-D#; Marcum, Tr. 4198#) The gross profits achieved by Monsanto's ACL business declined over the 1979-1982 period from # # (CX 225-D#; Marcum, Tr. 4198#) The return on capital ("ROC") for Monsanto's ACL business declined over the 1979-1982 period, # # (CX 225-D#; Marcum, Tr. 4198#)

457. In 1983, Monsanto's ACL business management anticipated that the performance of its isocyanurate business would improve substantially in the near future. (CX 225-G; Marcum, Tr. 4199#) # # (CX 225-I#; Marcum, Tr. 4200#) Monsanto's ACL business actually exceeded its 1983 planning goals for gross profits in both 1984 and 1985. # # (CX 225-I#; Marcum, Tr. 4200#) # # (CX 225-I, K#; Marcum, Tr. 4201#)

458. After the consummation of the Olin/FMC acquisition, Monsanto's ACL management continued in their optimistic financial projections for the ACL business. In February, 1986, Monsanto knew about the acquisition and was fully aware of some post-acquisition market developments, including a plant expansion by CdF of France and Sigma's entry into the United States (CX 227-D#; CX 229-C#; Marcum, Tr. 4043-44, 4193-97#) # # (CX 225-K#; Marcum, Tr. 4201#)

459. A repacker witness testified that he believed that Monsanto approved of # # (Christensen, Tr. 1985#) Also, a number of repacker witnesses believed that if Olin were to raise its iso prices in the future, Monsanto would do the same. (Bloom, Tr. 712; Marshall, Tr. 1164; Castagnoli, Tr. 2481) [102]

460. Some repackers view Olin as their competitor inasmuch as Olin sells bulk pool chemicals to them and also sells its branded isos and cal hypo directly to distributors, who are repackers' pool sanitizer customers. A number of repacker witnesses voiced a strong concern that, should Olin's acquisition be permitted to stand, Olin may choose to force repackers' profit margins down to an unacceptable level by raising its bulk prices to repackers and lowering its prices to distributors. It is said that such a profit squeeze will drive many repackers out of business, leaving Olin free to raise its branded pool chemical prices to the distributor, all to the detriment of the consumer. *E.g.*, CX 116-D; Kennedy, Tr. 530-31; Marshall, Tr. 1162-64; Christensen, Tr. 1893-99; Schaub, Tr. 2112; Castagnoli, Tr. 2537-39; Wilson, Tr. 4328-29.

461. Mr. Marcum of Monsanto testified that Monsanto views repackers as # # (Marcum, Tr. 4083-84#) Monsanto has attempted to assuage repackers' concerns by # # (Marcum, Tr. 4081-83#)

462. Mr. Marcum further testified that Monsanto is "quite committed to this [isos] business" which, in the past thirty years, has generally # #; the isos business is considered "part of the long-range plan for" Monsanto. (Marcum, Tr. 4078-79#)

d. PPG Industries—Cal Hypo

463. PPG Industries ("PPG") has been producing cal hypo in the United States since 1942, initially at a plant in Barberton, Ohio, and since 1984, at a new plant in Natrium, West Virginia. # # (CX 552-E-G#)

464. The new technology and integrated production of chlorine and caustic at Natrium help to make PPG a relatively low cost producer of cal hypo. (CX 548-H)

465. PPG's annual cal hypo production, in thousands of pounds, for 1980-1985 was as follows: [103]

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
Natrium#						#
Baberton#						#
(CX 551-E#; CX 552-B#)						

466. PPG sells its cal hypo as pool chemicals and for industrial use. Its cal hypo sales account for about 0.1% of PPG's total sales. (Hughes, Tr. 5160) PPG sells approximately # # of its cal hypo in bulk form to repackers and approximately # # to distributors of swim pool sanitizers packaged primarily under their own private labels. (Hughes, Tr. 5222-23#) PPG also exports approximately 20% of its cal hypo overseas. (Hughes, Tr. 5182)

467. PPG's October, 1984 Calcium Hypochlorite Business Strategy Paper, published after PPG's Natrium plant was on-line, states that "Olin is the dominant force in the swimming pool chemical business." (CX 549-C; *see also* CX 545-D; CX 548-H) PPG's stated objective is to become second to Olin in the cal hypo business with a 20 to 25% share (CX 545-F) and acknowledges that it is unable to compete on a par with Olin in the cal hypo business (CX 548-R). PPG's April 1, 1984, Business Strategy Paper states (CX 548-H): "To effectively compete and grow the calcium hypochlorite business, PPG must develop markets and customers that Olin cannot serve or chooses not to serve"

468. Similarly, PPG has followed Olin's pricing in the past and will continue to do so in the future. PPG's 1982 Business Strategy Paper indicates PPG's strategy is "to follow competitive pricing and achieve our position as an alternate source to Olin." (CX 545-G) PPG's 1983 Calcium Hypochlorite Profit Plan states that "PPG will continue to follow Olin's price leadership as marketplace conditions dictate on calcium hypochlorite." (CX 547) Richard Hughes, PPG's cal hypo business manager, acknowledged that PPG follows Olin's pricing lead. (Hughes, Tr. 5290) And, in the 1984 Calcium Hypochlorite Profit Plan, PPG stated a concern, in setting prices for its Pittclor brand of cal hypo, to refrain from "giving confusing signals to Olin." (CX 550-K)

469. PPG's 1982 Business Strategy Paper, after noting that PPG would follow Olin's pricing lead, stated that PPG's "[p]rivate label product will continue to be sold at prices which reflect the cost of promotional and advertising programs available with HTH and Pittclor but not provided with private label product." (CX 545-G-H)

This suggests that PPG's cal hypo prices to repackers were largely indexed to Olin's. [104]

470. PPG pursues a strategy of marketing private label brands of cal hypo to major distributors and dealers. (CX 547-B, C; CX 548-G-H, K; CX 549-A; Christensen, Tr. 1890-91; Hughes, Tr. 5301) PPG's private label program provides labeling, packaging, delivery service, warehousing and market research. (CX 549-A) PPG's own brand, Pittclor, accounts for less than 5% of PPG's domestic cal hypo sales and the company does not plan to increase its sales of or support for Pittclor. (CX 548-J, K; CX 549-A, D; CX 550-C; Hughes, Tr. 5173, 5301) Pittclor is not viewed as a major factor in the marketplace. (CX 5-B; Christensen, Tr. 1890-91)

471. PPG's long term strategy in its cal hypo business is "to emphasize profitability versus large sales volume gains" (CX 548-J) and regards cal hypo business to be attractive "because of the high returns generated, limited number of competitors, and the healthy, stable growth rate." (CX 548-J)

472. It is also # # (CX 552-H#) PPG's Mr. Hughes acknowledged that PPG would support price increases if it thought the market would bear such an increase. (Hughes, Tr. 5290) Also, the perception in the industry is that PPG tends to follow Olin's pricing lead in cal hypo. (CX 312#; CX 360-A#; Bloom, Tr. 712; Castagnoli, Tr. 2458, 2532-33)

473. PPG announced a 10% increase in the price of cal hypo on August 2, 1985, effective September 15, 1985. (CX 681)

474. Although PPG to date has been "moderately successful" in the cal hypo business (CX 27-C), PPG is not perceived as a threat by Olin. (CX 326) Even after the development of new technology and the construction of the Natrium plant, PPG's costs are not as low as Olin's. (Hughes, Tr. 5250; Henske, Tr. 7243#) And PPG's advertising and service support for its cal hypo products has historically been less than that of Olin. (Wetzel, Tr. 5475-76)

475. PPG plans to increase its output over 1986 and 1987 levels in 1988 and 1989 by "grow[ing] approximately twice as fast as the market growth of the business," *i.e.*, grow at an 8% annual rate, by taking market share from Olin, the Japanese and Saskatoon. (Hughes, Tr. 5166-67)

476. PPG can increase cal hypo output at the Natrium plant without any plant expansion and intends to do so in 1987-88 if market demand for cal hypo increases. (Hughes, Tr. 5162-63) PPG has also [105] # # (Hughes, Tr. 5222#)

2. Foreign Producer/Importers

a. *Shikoku Chemical/Mitsubishi/ICI America*

477. Shikoku Chemical Corporation ("Shikoku"), a Japanese firm, manufactures CA, trichlor and dichlor at its plant in Kagawa Prefecture, Japan. (CX 179-Z36) Shikoku sells isos for export into the United States to Mitsubishi International Corporation of Japan. Mitsubishi International, a trading company, transports the isos to the United States and, through its subsidiary Mitsubishi America, sells to ICI Americas, Inc. ("ICI America"), which is the importer and marketer for Shikoku isos in the United States. (CX 125-A#; CX 126-A#; Pettoruto, Tr. 1311-12, 1314-15) Shikoku has been selling isos in the United States for fifteen years. (Ishida, Tr. 918; Pettoruto, Tr. 1311) ICI America is a wholly-owned subsidiary of Imperial Chemical Industries, PLC, a United Kingdom concern. (CX 179-Z21) ICI America imports Shikoku isos in 250-280 pound fiber drums and resells the product in the United States to pool chemical repackers. (Ishida, Tr. 931)

478. Shikoku's annual exports of isocyanurates to the United States, in thousands of pounds, for the years 1980-1985 were as follows:

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
#						#
(CX 583-B#; CX 674-C, D#)						

479. Shikoku's capacity for iso production is # # (CX 674-D#) # # (Ishida, Tr. 966#; Kamerschen, Tr. 2700#) # # (Ishida, Tr. 965#; Kamerschen, Tr. 2701#)

480. The quality of Shikoku/ICI America's isos is said to be as good as or better than that of any domestic producers. (Jonas, Tr. 2315-16#) The service is good and there are no problems with delivery. (Sossamon, Tr. 4624-25) ICI America has a reputation of matching lower prices of domestic producers. (Wilson, Tr. 4276) In addition to isos made by Shikoku, ICI [106] America also sells in the United States Baquacil, a pool chemical product produced by its parent company, Imperil Chemical Industries Plc.

481. Shikoku is thought to be a high cost iso producer. (CX 34-X; CX 259-R#; CX 269-Z12#; CX 502-Y#; RX 32-O#; Turnipseed, Tr. 7883#) Energy costs are higher for Shikoku, and for Japanese firms generally, because of reliance on imported oil. (CX 332-G#; CX 377-

N#) Transportation costs also are higher for Japanese firms selling in the United States than for domestic firms.

482. Shikoku does not produce chlorine, caustic soda or urea but rather buys these raw materials for CA from outside suppliers. (Ishida, Tr. 966-67#) Olin considered Shikoku to have higher CA costs than # # (CX 259-P#; CX 269-Z14#; CX 502-S#; RX 32-M#; Swartley, Tr. 7059-60#; Turnipseed, Tr. 7883#) FMC similarly considered Shikoku to be a high-cost CA producer. (CX 34-X)

483. Shikoku has a policy of strong commitment to its long standing export customers. Norihisa Ishida, General Manager of Shikoku International, explained:

If we have a long time customer, and if we find certain parts of the market that pays [sic] much more for the same product, . . . we don't feel that comfortable . . . reduc[ing] the quantity, volume, to the existing long time customer and shift[ing] to the higher priced customers.

(Ishida, Tr. 969) Shikoku also has substantial market presence in other export markets, including Europe, Australia, New Zealand, and South America. (CX 9-Z27, Z29; CX 127-H#)

484. Mr. Ishida explained that Shikoku also has a policy not to commit a substantial portion of the company's iso sales to a single market. (Ishida, Tr. 924) The United States is and has been for years Shikoku's largest iso market. At one time, the United States accounted for about 50% of Shikoku's iso sales. (Ishida, Tr. 923) In 1981, Shikoku decided to hold the percentage of its total sales going to the United States market long term at below 50% in order to reduce the risk of overcommitting to the United States market. (Ishida, Tr. 922-24)

485. Because of its higher costs, capacity constraints, and commitment to other export markets (CX 9-Z29; CX 127-H; Kamerschen, Tr. 2705), and because of the constraints resulting from the iso dumping proceeding and the increasingly unfavorable yen/dollar exchange rates, Shikoku is unlikely in the future to [107] increase its United States exports significantly. Thus, it is unlikely that Shikoku will exercise a restraining influence on iso price increases in the United States market.

486. # # (CX 266-E#) # #

487. Comparing Shikoku's size with Olin's, Shikoku used the analogy that # # (CX 333-A#) # # (CX 797-D#) # # (CX 797-C#) # # (CX 333-A; Turnipseed, Tr. 7879#)

b. *Nissan Chemical/Toyo Menka—Isos*

488. Nissan Chemical Industries, Ltd. ("Nissan Chemical" or "Nissan") is a Japanese manufacturer and United States exporter of CA and chlorinated isocyanurates. The company is headquartered in Tokyo and manufactures these products at its Toyama, Japan plant. Nissan has manufactured CA and chlorinated isocyanurates since the mid-1960's.

489. Nissan's isos are exported to the United States by Toyo Menka Kaisha, Ltd., a Japanese trading company, whose wholly owned subsidiary Toyomenka (America), Inc. serves as the importer and marketer in the United States (CX 179-Z37; CX 676-N#) Toyomenka America sells isos only to repackers. (Christensen, Tr. 1975#)

490. Nissan's annual exports of isocyanurates to the United States, in thousands of pounds, for the years 1980-1985 were as follows:

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
#						#

(CX 236-H#; CX 237-H#)

491. # # (CX 676-Z206-07#) # # (CX 236-H#; CX 237-H#)
[108] # # (CX 677-Z10-11#)

492. Nissan's initial isos capacity was approximately # # (Bloom, Tr. 705#) Nissan purchases its chlorine and caustic on the outside. (CX 676-Z32#; Ishida, Tr. 982-83#) # # (CX 240#) and has sold CA to other iso producers, including Olin (CX 475-N#; CX 811-A#; RX 49-D#; RX 50-A#), Chlor-Chem (CX 64-Z21; Kitagawa, Tr. 2392-94#), Shikoku (CX 664-Z26-27; Swartley, Tr. 7405#; Turnipseed, Tr. 7760#), and Delsa (RX 358-C#).

493. Chlorine and caustic soda are a significant component of Nissan's costs. # # (RX 265-A#) Nissan has increased its production capacity for CA, dichlor and trichlor twice through debottlenecking over the past five years. In 1983, Nissan's CA capacity increased from # # per year to # # per year, and in 1984, to # # per year. (RX 279#) Trichlor powder annual capacity expanded in 1984 from # # to # # and again in 1986 to # # (RX 278#) Nissan also expanded its dichlor annual production capacity in 1984 from # # and, in 1986, to # #. (CX 237#; CX 676-Z58-Z60#) Nissan has also explored the feasibility of two or three further debottlenecking operations of isocyanurate capacity, with the potential addition of two or three million pounds. (CX 676-Z46-Z47#)

494. # # (CX 676-Z207#) # # (CX 236-J#; CX 237-J#) # #

(Christensen, Tr. 1800, 1802#) # # (CX 676-Z57-60#) # # (CX 676-Z60#)

495. # # internal cost estimates place Nissan at a cost disadvantage compared to domestic iso producers (CX 34-X; CX 259-R#; CX 269-Z11#; CX 502-Y#; RX 32-O#), although these same analyses show Nissan to be on a par with or better than the domestic producers in terms of its cyanuric acid costs. (CX 34-X; CX 259-P#; CX 269-Z13#; CX 502-S#; RX 32-M#) [109]

496. # # (CX 266-E#)

497. There is evidence indicating that Toyomenka America sold # #. (CX 677-Z180, Z181#) In 1985, York Chemical, a repacker, was facing a significant shortage of isos supply because of Monsanto's production difficulties and York's underestimation of its customers' demand. York was able to make up some of the shortfall by purchasing product from Toyomenka America on relatively short notice and at competitive prices. (Castagnoli, Tr. 2490-91) A witness testified that in 1986, Toyomenka America was selling trichlor at # #. (Bloom, Tr. 745-46#)

c. Nippon Soda/Toyomenka—Cal Hypo

498. Nippon Soda Company, Ltd. ("NISSO") produces cal hypo in Nihongi, Japan. (CX 175-Z54; CX 388-A; CX 429-E#) Toyomenka (America) Inc. is the exclusive marketer of Nippon Soda cal hypo in the United States. (CX 175-Z54) Nippon Soda produces several grades of cal hypo, some of which is a 60% grade, unsuitable for swimming pool use. (CX 429-K-L#; CX 553-A) Nippon Soda did not receive EPA approval to sell 65% grade cal hypo in the United States until 1983. (CX 175-Z93)

499. Nippon Soda's production capacity for pool sanitizer cal hypo is 35,274,000 pounds annually. (CX 388-B) In a May, 1984 statement to the ITC, a Nippon Soda official said that Nippon Soda had little excess cal hypo capacity, that it had no plans to expand capacity, and that any expansion would take at least two years to implement. (CX 175-Z55; CX 373-B; CX 388-B) # # (CX 377-M#; Kosche, Tr. 8959#) # # (Kosche, Tr. 8964-65#)

500. Nippon Soda is the largest of the three Japanese cal hypo producers (CX 271-I#) but reportedly follows the pricing lead of the smaller Toyo Soda. (CX 323-A#) It has been observed that Nippon Soda's cal hypo business can be adversely affected during times of caustic soda shortage. (CX 332-F#)

501. The volume of Nippon Soda cal hypo exported to the United States # # (CX 611-Z19#) [110]

502. Nippon Soda currently also produces less than a million pounds of isocyanurates in Japan and sells isos in Japan and Europe. (CX 323-B#; Ishida, Tr. 976-78) Direct evidence of Nippon Soda's iso production capacity was unavailable at trial. The plant's announced capacity was 6.6 million pounds. (Ishida, Tr. 977) Estimates by Olin and others place Nippon Soda's iso capacity at approximately 7 million pounds. (CX 259-H#; CX 323-B#; CX 390-B#; CX 393-C#; CX 396-B#; CX 416-Z4#; CX 450-I#; CX 451-C#; CX 465-K; CX 651-B#; CX 676-Z152#; CX 871-C#)

503. Nippon Soda isos have not been sold in the United States. (CX 323-B#; Marcum, Tr. 3968) Nippon Soda is not a member of Isocyanurate Industry Ad Hoc Committee, nor has it been in contact with the Ad Hoc Committee since experiencing production difficulties. (Ishida, Tr. 972-73; Marcum, Tr. 3970) Olin has acknowledged that Nippon Soda has had "considerable difficulties" with its isos manufacturing facility. (Turnipseed, Tr. 7539-40) A January, 1985 FMC internal estimate placed Nippon Soda's capacity at zero after learning of a rumored shutdown. (CX 668-C#)

d. Toyo Soda—Cal Hypo

504. Toyo Soda Manufacturing Co., Ltd. ("Toyo Soda"), through its 34.5% owned subsidiary, Nisshin Denka Company, Ltd., manufactures cal hypo in Yamagata Prefecture, Japan. Toyo Soda also sells chlorine and caustic soda. (CX 429-Z10-11#) Toyo Soda cal hypo is imported and sold in the United States by ICD Group, Inc. (CX 120-B) and by Nissho Iwai American Corporation. (CX 254) Based on available data, the highest annual volume of Toyo Soda cal hypo imported into the United States has been approximately 4.4 million pounds. (CX 120-B; CX 254-B-C)

505. # # (CX 416-D#) Another estimate places Toyo Soda at a 12 million pound level. (CX 5-A) A significant portion of Toyo Soda's production (an estimated 20-35%) is of the lower-grade 60% cal hypo, which is unsuitable for pool use. (CX 332-F#; CX 429-Z15#) The bulk of Toyo Soda's cal hypo production, including that imported to the United States, is of the less desirable 70% variety, which is considered a potential fire hazard. (CX 429-Z15#; CX 553-B; Castagnoli, Tr. 2432) ICD has been unable to market Toyo Soda's 65% cal hypo product in the United States as a pool sanitizer because it has lacked the necessary EPA registration. (CX 123-D-E)

506. In April, 1984, Olin advised the ITC that the Toyo Soda cal hypo plant was believed to be operating at # # of capacity. (CX 377-M#) [111]

507. # # (CX 332-F#) # # (CX 429-Z10) # # (CX 323-A#), # # (CX 271-J#; CX 332-H#) Toyo Soda's cal hypo product has reportedly had some problems with granulation, which have hurt sales in the United States. (CX 613-B#)

e. Other Japanese Cal Hypo Producer/Exporters

508. Nankai Chemical Industry Co., Ltd. ("Nankai") manufactures cal hypo in Kochi Prefecture, Japan. (CX 429-Z32#) Nankai also sells chlorine and caustic. Nankai cal hypo is imported into the United States by Nishho Iwai American Corporation and distributed in the United States by ICI. (CX 124-A#; CX 254)

509. # # (CX 416-D#) Other estimates put Nankai at somewhat lower levels. (CX 5-A; CX 427) Most of Nankai's cal hypo sales are in Japan (CX 332-G#), with less than 20% being exported to the United States. (CX 427) A large portion of Nankai's production (an estimated 25-40%) is devoted to 60% cal hypo, which is unsuitable for pool use. (CX 332 G#; CX 429-Z38#) In addition, all of Nankai's cal hypo imports into the United States in 1983 were of the less desirable 70% variety. (CX 553-B)

510. Based on available data, the highest annual volume of Nankai cal hypo imported into the United States has been 828,000 pounds. (CX 254-B) Nankai cal hypo is said to be inferior to that of the domestic cal hypo producers. (CX 613-B#; Castagnoli, Tr. 2432-33) Nankai has reportedly had production difficulties. (CX 418-B)

511. Japanese cal hypo producers, as a group, are believed to have been operating # # (CX 545-E; Hughes, Tr. 5319-20#) # # (CX 175-Z7)

512. There is also industry perception that Japanese cal hypo product quality is not as good as that of the domestic producers. (CX 344-B#; CX 525#; Kennedy, Tr. 505-08; Hughes, Tr. 5320-21#; Wetzel, Tr. 5471-74) The Japanese product does not dissolve as well as United States material. (Kennedy, Tr. 505-08; Wetzel, Tr. 5471-74) Much of the Japanese cal hypo imported [112] is of the 70% variety, which is considered a potential fire hazard. (CX 127-Q#; CX 173-M; CX 549-C) Also, about one-quarter of the combined Japanese cal hypo capacity is believed to be for the production of low strength bleach powder which is not acceptable for swimming pool use in the United States. (Hughes, Tr. 5319-21#)

513. Japanese cal hypo producers also face higher costs than their United States counterparts in several respects. For example, they face high energy costs which makes chlorine and caustic soda, two key raw materials, more expensive. (CX 259-N#; CX 332-G#; CX 377-N#; CX 545-C) Manufacturing cost estimates calculated several years ago, using an exchange rate of 230 yen to the dollar, show that the Japanese cal hypo producers had no significant manufacturing cost advantage over the major United States producers. (CX 271-J#; CX 332-H#) The differential has since shifted to the disadvantage of the Japanese producers as the yen has strengthened to around 150 to the United States dollar.

514. The lead time required for the delivery of cal hypo from Japan to the United States can be a significant problem and risk for United States repackers who are engaged, in the most part, in a seasonable business. (CX 173-Z62-Z63) Japanese shipping regulations require cal hypo to be shipped from Japan in steel drums, which also add to the cost of the product leaving Japan and to the cost ultimately faced by a United States repacker purchasing Japanese cal hypo, as the repacker incurs additional costs, over the price of the material, in order to dispose of the drums. (Schaub, Tr. 2193-94)

515. The Japanese cal hypo producers are not viewed as a significant competitive threat by either Olin or PPG. (CX 343-A#; CX 545-C, E)

f. Other Foreign Producer/Exporters

(1) Sigma

516. Sigma Prodotti Chimici, SpA ("Sigma") is an Italian company that manufactures chlorinated isocyanurates at its plant in Bergamo, Italy. (Kennedy, Tr. 514; Marcum, Tr. 3967-68) Sigma is said to have begun producing dichlor and trichlor in commercial quantities in 1986. (Marcum, Tr. 4043-46)

517. Evidence from Sigma regarding its iso production capacity was not available at the trial. Olin's internal estimate, placed # # (CX 651-B#) Marshall Bloom of Bio-Lab, who has visited Sigma's [113] plant, places # # (Bloom, Tr. 700-01) # # (CX 478-Z7; CX 492#)

518. Sigma acquired the necessary permits to begin sales of dichlor and trichlor in the United States for use as a swim pool sanitizer in early 1986. (RX 194; CX 638-A; Marcum, Tr. 4043-46; CX 677-Z57, Z-58#) Sigma began sales of dichlor and trichlor to the United States a few months thereafter. (RX 190-C; Kennedy, Tr. 515; Pettoruto, Tr.

1380-81#) Sigma exports isocyanurates to the United States through its wholly-owned subsidiary, 3-V Chemical Corporation ("3-V"). (CX 677-Z60#; RX 190; Rx 246#) 3-V sells the dichlor and trichlor it purchases from Sigma under the trade name Oxidan. (RX 190-A) There is testimony indicating that Sigma's product quality was poor in 1986. (Schaub, Tr. 2093; Jonas, Tr. 2253-54)

519. 3-V Chemical Corporation began offering Sigma isos for sale in the # # (CX 492#; RX 194#) It is not known, however, what quantity of Sigma isos has been imported into this country, beyond a few samples. (Marcum, Tr. 4045) A major repacker purchased two truckloads but returned part of that due to quality problems. (Marshall, Tr. 1140#) A second major repacker, Bio-Lab, purchased only trial samples. (Bloom, Tr. 697) A third repacker found Sigma's quality to be unacceptable. (Jonas, Tr. 2253-54) Another repacker located on the West Coast has not encountered any Sigma iso products and has not been solicited by 3-V salesmen. (Christensen, Tr. 1851)

520. 3-V reported no United States sales in 1985 and only 11,000 pounds of iso sales in the United States in 1986, as of April 3, 1986, the date of the company's subpoena response. (CX 643-C, Z)

521. Sigma was not viewed as a factor in 1985, around the time of the Olin/FMC acquisition. (CX 223-A#) Much of its efforts are anticipated to be in non-pool uses of isos. (CX 224-A#)

(2) CdF Chimie—Isocyanurates

522. CdF Chimie SA ("CdF") is a French company which produces CA and isocyanurates at a plant in Toulouse, France. The firm is also known as Societe Toulousaine de Synthese SA ("STS"), which is reportedly owned 75% by CdF and 25% by Azotes et Produits Chimiques SA ("APC"). (CX 179-Z39; CX 258-H; CX 465-I; CX 666-A) CdF is at least partially subsidized by the French Government. (CX 127-T#) [114]

523. CdF has been known since the 1960's as a European producer of isos (CX 666-A) and, at one time, sold product in the United States that was not viewed as price-competitive. (Jonas, Tr. 2255-56; Turnipseed, Tr. 7471) CdF has the capacity to produce about 7 million pounds of isos per year. (CX 15-A, B-C; CX 478-Z2; CX 651-B#; Ishida, Tr. 987) There is evidence indicating that CdF increased its isos capacity to about 13 million during the 1984-1985 period. (RX 93-A#; RX 340#; CX 325-A#)

524. CdF is not a member of the Isocyanurate Industry Ad Hoc

Committee and does not export any isocyanurates into the United States for swimming pool use. (Jonas, Tr. 2255; Marcum, Tr. 3968, 3970) CdF had minimal exports of dichlor into the United States in 1985, through its United States subsidiary, CdF Chimie North America. (CX 3; RX 340-A, B#) CdF is not viewed as a factor in the United States market. *E.g.*, CX 223-A#. Moreover, CdF has very little excess capacity (CX 15-A; CX 478-Z2), purchased CA from # # occasionally (CX 676-Z144-Z49#), and sought to purchase isos from FMC in late 1984. (CX 478-Z4-Z5) Although CdF produces CA, it does not produce chlorine or caustic soda. (CX 319-A#) CdF is also known to have experienced production difficulties. (CX 375-T#; CX 478-Z2)

(3) Saskatoon Chemical—Cal Hypo

525. Saskatoon Chemical, Ltd (“Saskatoon”), a Canadian firm, is a division of Prince Albert Paper, Ltd. and is owned by the provincial government of Saskatchewan, Canada (CX 426-B; CX 467-A) and exported some cal hypo to the United States in 1986. (Hughes, Tr. 5252) Saskatoon built a cal hypo plant in Saskatchewan, Canada, using licensed technology from Canadian Industries Limited and similar to that used in an unsuccessful pilot plant in Yugoslavia. (CX 426-B, E; CX 467-A; Hughes, Tr. 5252) Saskatoon’s entry into the production of cal hypo appears to have been as a result of a need to dispose of excess chlorine by-product from other chemicals operations. (CX 426-B)

526. Saskatoon reportedly commenced construction of a cal hypo plant in 1981 or early 1982, scheduled for completion in late 1983. (CX 467-A) Major start-up problems ensued, including a process-related fire, and whatever product was manufactured in 1984 was of inferior quality. (CX 127-Q#; CX 175-Z65-66; CX 177-Z3-4; CX 377-T#; CX 466-B#; CX 471-O#; CX 476-Z32#; Schaub, Tr. 2015) # # (CX 472-Z1#) and # # (CX 466-B#) A repacker witness testified that Saskatoon’s production and inferior product quality adversely affected one United States repacker, which went into Chapter 11 bankruptcy after having relied heavily on Saskatoon cal hypo to meet its [115] 1985 cal hypo needs. (Schaub, Tr. 2015)

527. Saskatoon’s product quality appears to have improved since it recommenced production in 1986. (Castagnoli, Tr. 2433; Vonderlow, Tr. 4803, 4836, 4882) However, # # (CX 476-Z33-34#) Some repackers reportedly did not purchase Saskatoon cal hypo despite lower prices. (Sossamon, Tr. 4626; Smith, Tr. 6672)

528. Saskatoon is believed to have higher unit production costs than either Olin or PPG. (CX 259-O#; Hughes, Tr. 5239-40#; Henske, Tr. 7243-44#) Saskatoon reportedly produces the less desirable 70% cal hypo and utilizes a lower quality lime. (CX 467-A) PPG's cal hypo business manager, Mr. Hughes, testified when Saskatoon began selling in the United States in 1985, its price ranged from 5 to 10% lower than PPG's and that PPG is projecting a similar range of price differential into the future. (Hughes, Tr. 5185-86, 5298-99) A major repacker whose firm markets the "Olympic" brand pool chemicals testified that Saskatoon is likely to follow Olin's pricing lead. (Castagnoli, Tr. 2458)

529. Actual data on Saskatoon's United States sales are not available. However, the DOC cal hypo import data show imports of 272,000 pounds from Canada for 1985, and none from Canada for prior years. (CX 684-D, F, H, J, L, S)

530. Saskatoon's cal hypo production capacity has been variously estimated to be about 12 million pounds annually. (CX 582-C#; Pettoruto, Tr. 1333; Schaub, Tr. 2082; Hammersmith, Tr. 6044) Saskatoon is said to have commitments to supply cal hypo to customers in Canada and Australia as well as some in the United States (Schaub, Tr. 2082) and reportedly has a limited capacity available for sale in the United States. (Schaub, Tr. 2082; Jonas, Tr. 2255; Hughes, Tr. 5185)

531. The record also contains evidence regarding other foreign producers of isos or cal hypo. Of those, a Spanish company known as Delsa is the only firm which reported any export of either product into the United States.

532. Derivados Electroquimicos Levante S.A. ("Delsa") produces isos at its plant in Barcelona, Spain. (CX 179-Z39; CX 465-I#) The company has been producing trichlor since 1973 and dichlor since 1979. (RX 358-B#) Delsa is not a member of the Isocyanurate Industry Ad Hoc Committee and does not have an EPA registration to sell isos in the United States for swimming pool use. (Bloom, Tr. 702; Marcum, Tr. 4163) Delsa operates under a [116] CdF license and has purchased CA from CdF and, more recently, Nissan. (CX 246; CX 319-A#; CX 465-I, J; RX 358-C#; Turnipseed, Tr. 7776-77) Delsa does not appear to be vertically integrated into chlorine or caustic soda. (CX 319-A#; Turnipseed, Tr. 7867#) Delsa reported about 200,000 pounds of isos shipment to the United States in 1985. Delsa has only one United States customer and reportedly has no plans to start marketing isos in the United States. (RX 358#)

533. Enquidesa, another Spanish firm, has been identified as a producer of isos. The company does not sell isos in the United States. (Marcum, Tr. 3968)

534. There are occasional references in the record to cal hypo manufactured in mainland China. (CX 123-B; CX 409#; CX 553-C; Christensen, Tr. 1780-81) The evidence indicates that the Chinese product has a chlorine content of 60% or less (CX 409#; CX 524; CX 527-A; CX 553-C) and is generally considered unsuitable for pool use. (CX 527-A; CX 528) The Chinese cal hypo is reportedly of poor quality (CX 377-S-T#; CX 524; CX 545-E; CX 587-E) with a high lime content (CX 527-A) and is not considered a factor in the United States (CX 123-B) or elsewhere. (CX 545-E)

535. There are other references in the record to cal hypo manufactured in Europe (CX 529) and India. (CX 526) These products are reportedly of inferior quality and low in chlorine content. (CX 526; CX 529)

B. The Challenged Acquisition Exacerbated the Concentration in the Relevant Markets to an Unacceptably High Level and Is a Likely Violation of Section 7 of the Amended Clayton Act Unless Saved By Other Relevant Factors

1. Measurement of Market Share

a. The Data Base—General

356. The quantitative data related to the production, sales and production capacity used to determine the market shares of the various firms in this case were obtained, in the most part, directly from the firms involved through pretrial discovery by means of compulsory and voluntary process by the parties, mostly through joint requests and joint subpoenas.² [117]

537. This is not to say that the quantitative data employed in the market share measurement and concentration analysis which follow is free from minor deficiencies or that their precision could not have been improved with expenditures of more time and funds. For example, the capacity and production figures for isos and cal hypo could have been broken out between residential and commercial uses. However, the capacity and production data reported by responding firms described hereinabove, together with other quantitative information contained in

² The accuracy and reliability of information related to foreign producers have been materially advanced with the cooperation of foreign corporations secured through the good offices of government authorities of Japan and the EEC member nations.

the planning and marketing documents of the major industry participants as well as information offered by many witnesses representative of the various segments of the pool chemicals business, is sufficient for the purpose of an overall assessment of the order and magnitude of market shares of the various participants in the relevant markets and to determine whether the challenged acquisition may tend to lessen competition substantially in the relevant markets. It is well-recognized that in Section 7 cases "precision in detail is less important than the accuracy of the broad picture presented." *Brown Shoe Co. v. U.S.*, 370 U.S. 194, 341-42, n. 69 (1962); *Luria Bros. v. FTC*, 389 F.2d 847, 858 (3d Cir. 1968), *cert. denied*, 393 U.S. 829 (1968); *Papercraft Corp.*, 78 FTC 1352, 1404-06 (1971), *aff'd as modified*, 472 F.2d 927 (7th Cir. 1973).

b. *Olin's Isocyanurate Capacity at the Lake Charles Plant*

538. The *DOJ Guidelines* provide, in the context of product market definition, that "[i]f a firm has existing productive and distributive facilities that could easily and economically be used to produce and sell the relevant product within one year in response to 'a small but significant and nontransitory' increase in price, the Department will include that firm in the [product] market." *DOJ Guidelines* § 2.21. The *DOJ Guidelines* also makes clear that, for the purposes of calculating market shares "total sales or capacity may overstate the competitive significance of a firm" and that the DOJ will "include only those sales likely to be made or capacity likely to be used in the market in response to 'a small but significant and nontransitory' increase in price." *DOJ Guidelines* § 2.4.

539. The evidence shows that the production of isos at Olin's Lake Charles plant was suspended effective August 1, 1984 "until further notice." (CX 402) The Olin announcement [118] indicated that it had concluded a raw materials tolling arrangement with another manufacturer and that it would continue to sell the product under the PACE brand. Olin further explained in the announcement that "this action was taken for economic reasons since current conditions favor contract tolling the product for an interim period instead of manufacturing it" and that "during the interim period" the Lakes Charles "isocyanurate manufacturing facilities will be kept in stand-by condition." (CX 402)

540. The evidence also shows that after Olin ceased trichlor production at Lake Charles, Olin continued to be a major contract-

producer-seller of isos (PACE brand) through the Monsanto Toll (CX 469#) until it reopened the Lake Charles plant in October, 1985, after the challenged acquisition was consummated in August, 1985. Monsanto Toll obligated Olin to supply # # and take # # pounds of isos per month from Monsanto during the contract term. (CX 469-A-C#; Kosche, Tr. 8953#) Therefore, for the purposes of a realistic assessment of the present and future effect of the acquisition, Olin's 1984 isos market share in terms of capacity and production should be measured on the basis of Olin's 1984 trichlor capacity and production at Lake Charles, and Olin should be treated as an on-going producer-seller of isos before and after the acquisition. This common sense approach would also be in accord with Olin's own corporate intentions and plans as well as the industry's perception of Olin as a producer-seller of isos during that period.

541. In any event, Olin's decision to "waterbatch" and not to "mothball" the Lake Charles trichlor facility was a deliberate corporate decision, made at the highest level, that Olin chose the "waterbatching" over "mothballing," at considerable additional costs, in order to maintain the facilities in a higher state of readiness, and that Olin wanted to be able to, and fully intended to, resume production at the plant within 60 to 90 days, presumably whenever it thought the "economic conditions" favored manufacturing over tolling. (CX 655-L; CX 656-Z48#; Johnstone, Tr. 6295-96#)

542. Also, what clearly emerges from a review of Olin's contemporary corporate documents, as largely corroborated by corporate management witnesses, is that (1) Olin's firm commitment to produce and sell isos along with cal hypo never wavered at Olin's senior corporate management level; (2) Olin's management actively pursued that corporate objective and was determined to overcome whatever technological or production economics problems that lay in the path to profitability of Olin's isos business; and (3) to that end Olin sought new and superior CA technology through both stepped-up in-house process [119] development efforts and acquisition or licensing of "proven" CA technology from others. Olin also continued to stockpile CA during the period of Monsanto Toll, to be used for resumption of its own trichlor production at Lake Charles after the toll agreement ended.

543. It is fair to conclude, on the basis of the record as a whole, that Olin's corporate management was determined to become a factor in the production and sale of isos for pool use, preferably by internal

technological development but through any means to achieve that goal, and Olin's corporate management was ready, willing and able to provide necessary financial support to press the internal R&D toward that goal, that, as a result, Olin's management and technical staff at the operational level were about to implement an engineering plan for a CA pilot plant using a new, internally developed CA technology, and finally that these efforts were suspended when the FMC acquisition opportunity became promising.

544. Olin planned to suspend the operation of the Lake Charles trichlor on a temporary basis (CX 656-Z47-48#; CX 659-B#) and Olin's management, including Henske, Chairman of the Board and the CEO, Swartley, Olin's Executive Vice President of the Consumer Products Group, and Turnipseed, Director of Marketing and Sales for Olin's pool chemicals business, planned the purchase and stockpiling of CA from Nissan to provide the capability for restarting the trichlor plant at the end of the toll agreement. (CX 403-A-B#; CX 656-Z4, Z30#; Henske, Tr. 7272-73)

545. In response to a management inquiry, Olin's technical organization reported to Swartley that CA had a substantial shelf life and could safely be stockpiled for some extended period in excess of 2-3 years. (CX 656-Z4, Z31#; Henske, Tr. 7270-71) Olin's vice president for technology, Dr. O'Leary, # # (CX 398#) # # (Turnipseed, Tr. 7797#) and stockpiled # # (#Kosche, Tr. 8502#) # # (CX 659-B#)

546. Mr. Henske, Olin's CEO, directed and approved the waterbatching of Lake Charles. (CX 655-J-K, M) Mr. Henske did not intend to exit the iso business by the July, 1984 suspension of trichlor production but intended to secure CA supplies needed to resume the Lake Charles production at the end of the Tolling [120] Agreement. (CX 655-L-M; Henske, Tr. 7251) Mr. Henske intended that Olin would develop its own CA manufacturing capability in the meantime. (CX 655-L)

547. Mr. Henske, # # (CX 656-Z48#) Mr. Henske believed that mothballing the Lake Charles plant would have resulted in the plant becoming inoperable within 12-18 months. (CX 657-Q#; Henske, Tr. 7250-51) Mr. Henske felt that # # (CX 657-P#), # # (CX 657-P-Q#; Henske, Tr. 7270; *see also* CX 655-W; Johnstone, Tr. 6295-96; Kosche, Tr. 8496, 8498#) The total annual fixed costs of the trichlor plant while waterbatched were about \$7.6 million. (CX 659-A,C#) # # (Henske, Tr. 7252-53; 7261-67#) Peter Kosche, General

Manager of Pool Chemicals, testified that # # (Kosche, Tr. 8921-22#)

548. # #. (Turnipseed, Tr. 7919-21#) # # (CX 791-A#)

549. The evidence also clearly shows that, at Mr. Henske's direction, Olin's new CA technology development efforts were stepped up about when the Lake Charles waterbatching decision was made. In a memo to Mr. Swartley, dated September 20, 1983, Mr. Kosche # # (CX 768#) Subsequently, [121] # # (CX 768#; CX 769-A-B#; CX 778-A#) # # (CX 770-A-B#; Kosche, Tr. 8697-98#)

550. # # (CX 776-A#; RX 30-C-D,I#)

551. # # (CX 778-B#; Kosche, Tr. 8747-48#) # # (Kosche, Tr. 8755-56#) # # (CX 777-D#; CX 778-C#; Kosche, Tr. 8756#)

552. # #. (CX 777-A-D#) # # (CX 777-C#) [122] # # (CX 777-C#; Kosche, Tr. 8758, 8760-63#)

553. # # (CX 261-J#)

554. # # (Kosche, Tr. 8764-66#) # # (RX 29-A, I#) # # (RX 29-A#)

555. On December 7, 1984, Mr. Kosche received from # # (CX 765-A#) # # (Kosche, Tr. 8773#) # # (CX 765-D-E#; Kosche, Tr. 8775#) # # (CX 765-D#; Kosche, Tr. 8775-76#)

556. Olin's 1985 Pool Chemicals budget # # (Kosche, Tr. 8775#) Olin's corporate budget for 1985 also contained # #. (Swartley, Tr. 7410-11#)

557. On January 9, 1985, Dr. Gill's Monthly Highlight Report to Dr. Marano # # (CX 771-B#) # # [123] (Swartley, Tr. 7419#)

558. # # (Swartley, Tr. 7419-20#) # # (Kosche, Tr. 9055-56#)

559. Viewed in light of the evidence reviewed hereinabove, Olin's trichlor plant capacity at Lake Charles must be taken into account in measuring the overall industry capacity as well as Olin's true competitive position, in terms of capacity, at the time of the acquisition. Moreover, at the time of the acquisition, Olin remained a seller of PACE brand isos. Therefore, the challenged acquisition is horizontal in nature and should be analyzed as such. For all of these reasons, Olin's isos capacity at Lake Charles should be included in measuring the market shares of industry firms as well as gauging the extent of seller concentration in the relevant markets for the purposes of this case.

c. Capacity of Foreign Producers/Exporters

560. Needless to say, an assessment of the effects of the challenged

acquisition on competition in the relevant product markets in the United States must take into consideration the substantial imports which have accounted for almost 20% of isos and cal hypo used as pool chemicals in the United States. On the other hand, in determining the size of the United States isos and cal hypo market and the relative shares of that market of individual firms, it would be entirely inappropriate to include the total production capacities of these foreign producers.

561. The *DOJ Guidelines* state in pertinent part that if sales or shipments are used to measure shares of domestic firms, the market shares of foreign firms (who export to the domestic market) will also be measured using dollar sales in, or shipments to, the relevant market, and that if capacity or production is used for domestic firms, the shares of foreign firms will be measured in terms of the capacity “likely to be used to supply” or production “that is likely to be shipped to the relevant market in response to a ‘small but significant and nontransitory’ price increase” in the domestic market. The *DOJ Guidelines*, § 2.4 “Calculating Market Shares.” The *DOJ Guidelines* state finally that “a single market share may be assigned to a country or group of countries if firms in that country or group of countries act in coordination or if necessitated by data limitations.” *Id.* [124]

562. The evidence shows that, because of commitments to other markets, anti-dumping duty orders against Japanese producers of isos and cal hypo, yen/dollar exchange rates, advanced planning requirements, and historic geographic shipment patterns, as hereinafter discussed in some detail, the full capacity of these foreign firms is not readily available for diversion to the United States in response to “small but significant and nontransitory price increase” in the United States market.

563. In these circumstances, historic levels of imports are an appropriate proxy for quantifying the amount of capacity that foreign cal hypo and iso producers could readily use to restrain the anticompetitive behavior by the domestic producers. (Kamerschen, Tr. 2728-32) Therefore, in market share charts that reflect the two United States markets, historic import data are used as a surrogate for foreign firm “capacity,” “production” and “production value.” See F. 569, 573, 576, *infra*.

564. Our market share tables reflect a conservative approach to quantifying the historic United States export levels of foreign producers. With two exceptions, the United States market shares for

foreign firms reflect the highest level of exports over the 1980-1985 period. (CX 652-Q#; Kamerschen, Tr. 2729-30, 2732) An average was taken for Nippon Soda, which reported unusually high United States exports in 1983. (CX 652-Q#; Kamerschen, Tr. 2732) The smallest export figure was taken for Chlor-Chem, which is half owned by FMC. (CX 652-Q#; Kamerschen, Tr. 2732-34#)

2. Market Shares and Concentration

565. The *DOJ Guidelines* state that, in evaluating horizontal mergers, the DOJ will consider “both the post-merger market concentration and the increase in concentration resulting from the merger.” But, the DOJ also makes clear that it will consider “all other relevant factors that pertain to its competitive impact.” *DOJ Guidelines* § 3.11.

566. The *DOJ Guidelines*, also point out that “even in concentrated markets, it is desirable to allow firms some scope for merger activity in order to achieve economies of scale and to permit exit from the market.” The *Guidelines* go on to state that market share and concentration data serve only as the “starting point” for assessing the effects of a merger and “all other relevant factors that pertain to its competitive impact” need to be considered. *DOJ Guidelines* § 3.11. [125]

567. Under the *DOJ Guidelines*, in cases where the post-merger HHI is above 1800, the market is considered to be “highly concentrated” and additional concentration (an increase in the HHI of over fifty points) resulting from a merger in that market is “a matter of significant competitive concern.” *DOJ Guidelines* § 3.11(c). The market shares of Olin and concentration in each of the two markets alleged in the complaint passed the threshold of competitive concern after the acquisition. (Market figures may not appear additive due to “rounding off.”)

568. Furthermore, it is our view that because this acquisition involves two major firms in the relevant markets and the premerger market concentration was already high, and because this acquisition resulted in such unacceptably high level of concentration that the acquisition is a likely violation of Section 7, unless it is saved by some other relevant non-market share factors (which will be considered in later sections of this Initial Decision).

a. *The Isos/Cal Hypo Dry Pool Sanitizer Market*

569. The following tables reflect capacity and production market

shares and pre- and post-acquisition HHI's for the United States dry sanitizer market, at the time of the challenged acquisition: [126]

United States Dry Sanitizer Market
1985 Capacity
Thousands of Pounds

<u>Company</u>	<u>Rank</u>	<u>Capacity</u>	<u>% of Total</u>
<u>Olin</u>	<u>1#</u>	_____	_____#
PPG	2#		#
Monsanto	3#		#
<u>FMC</u>	<u>4#</u>	_____	_____#
Shikoku	5#		#
Nissan	6#		#
Nippon Soda	7#		#
Toyo Soda	8#		#
Wesley	9#		#
Nankai	10#		#
Delsa	11#		#
Saskatoon	12#		#
CdF Chimie	13#		#
Chlor-Chem	14#	_____	_____#
Total	#		#
Olin/FMC Post-Acquisition Share			# #
Post-Acquisition HHI			# #
Pre-Acquisition HHI			# #
Increase in HHI			1065

(CX 652-C#) [127]

United States Dry Sanitizer Market
1984 Production

<u>Company</u>	<u>Rank</u>	<u>000 lbs.</u>	<u>Share</u>
Domestic:			
<u>Olin</u>	1#	_____	_____#
Monsanto	2#		_____#
<u>FMC</u>	3#	_____	_____#
PPG	4#		_____#
Foreign:			
Shikoku	5#		_____#
Nissan	6#		_____#
Nippon Soda	7#		_____#
Toyo Soda	8#		_____#
Nankai	9#		_____#
Delsa	10#		_____#
Saskatoon	11#		_____#
CdF Chimie	12#		_____#
Chlor-Chem	13#		_____#
Total		_____#	_____#
Olin/FMC Post-Acquisition Share			# #
Post-Acquisition HHI			# #
Pre-Acquisition HHI			# #
Increase in HHI			1186

(CX 652-L#)

570. In the United States dry sanitizer market of isocyanurates and calcium hypochlorite, based upon capacity, Olin's share increased from # #% to # #%, with the FMC acquisition. (CX 652-C#) A market share of # #% "might give a firm power over price, regardless of the number or size distribution of its competitors." R. Posner, *Antitrust Law: An Economic Perspective*, 103 (1976). And, based upon capacity, the HHI increased by 1065, from # # to # #. (CX 652-C#)

571. In the United States dry sanitizer market, based on capacity, the acquisition increased the two-firm concentration ratio from # #% to # #%, and the four-firm concentration ratio from # #% to # #%. (CX 652-C#) Based upon the last full year of production prior to the acquisition, Olin's share increased from # #% to # #% with

the acquisition. (CX 652-L#) Based upon production, the HHI in the United States dry sanitizer market increased by 1186 from # # to # #. (CX 652-L#) Two-firm concentration increased from # #% to # #% [128] and four-firm concentration, from # # % to # #%. (CX 652-L#)

572. For both capacity and production market share tables, historical imports have been used as a proxy for the United States capacity of foreign companies. (CX 652-Q,R#)

573. The following table reflects the market shares, based upon the value of production in the United States dry sanitizer market, at the time of the acquisition:

<u>Company</u>	<u>Rank</u>	<u>Sales Based on Average Bulk Price</u>	<u>Share</u>
Domestic:			
<u>Olin</u>	1#	_____	_____#
<u>Monsanto</u>	2#		_____#
<u>FMC</u>	3#	_____	_____#
<u>PPG</u>	4#		_____#
Foreign:			
<u>Shikoku</u>	5#		_____#
<u>Nissan</u>	6#		_____#
<u>Nippon Soda</u>	7#		_____#
<u>Toyo Soda</u>	8#		_____#
<u>Nankai</u>	9#		_____#
<u>Delsa</u>	10#		_____#
<u>Saskatoon</u>	11#		_____#
<u>CdF Chimie</u>	12#		_____#
<u>Chlor-Chem</u>	13#	_____	_____#
Total		#	#
Olin/FMC Post-Acquisition Share			# #
Post-Acquisition HHI			# #
Pre-Acquisition HHI			# #
Increase in HHI			1301

(CX 652-P#)

The production value figures for each company are computed as the dollar value of production based on average bulk prices per pound.

Isocyanurate production volumes were assigned a value of \$1.45 per pound and calcium hypochlorite production volumes were assigned a value of \$0.85 per pound. (CX 652-P#)

574. Even if the capacity or 1984 production of Olin's waterbatched Lake Charles plant is not counted, Olin's market [129] share and the concentration levels remain essentially high enough to render the acquisition unacceptable. Based upon capacity (without Lake Charles capacity), the acquisition increased Olin's share from # #% to # #%. The HHI increased by 1036, from # # to # #. (CX 652-D#) Based upon 1984 production (without Lake Charles trichlor capacity), the acquisition increased Olin's share from # #% to # #%. The HHI increased by 1179, from # # to # #. (CX 652-M#)

575. Thus, whether viewed in terms of capacity, production, or sales, the acquisition raises grave competitive concerns. This competitive concern is especially acute at these market share levels not only because of the potential for collusive behavior but also because of the potential for leading firm behavior. (Kamerschen, Tr. 2742-54)

b. The Isos Pool Sanitizer Market

576. The following tables reflect the capacity and production market shares and the pre- and post-acquisition HHI's for the isos-only market, at the time of the acquisition:

United States Isos-Only Market
1985 Capacity

United States Capacity

<u>Company</u>	<u>Rank</u>	<u>000 lbs.</u>	<u>Share</u>
Domestic:			
Monsanto	1#		#
<u>FMC</u>	2#	_____	_____#
<u>Olin</u>	3#	_____	_____#
Foreign:			
Shikoku	4#		#
Nissan	5#		#
Delsa	6#		#
CdF Chimie	7#		#
Chlor-Chem	8#	_____	_____#
Total		#	#

Initial Decision

113 F.T.C.

Olin/FMC	Post-Acquisition Share	#	#
	Post-Acquisition HHI	#	#
	Pre-Acquisition HHI	#	#
	Increase in HHI	1114	[130]

(CX 652-A#)

United States Isos-Only Market
1984 Production
Thousands of Pounds

<u>Company</u>	<u>Rank</u>	<u>000 lbs.</u>	<u>Share</u>
Domestic:			
Monsanto	1#		#
<u>FMC</u>	2#	_____	_____#
<u>Olin</u>	3#	_____	_____#
Foreign:			
Shikoku	4#		#
Nissan	5#		#
Delsa	6#		#
CdF Chimie	7#		#
Chlor-Chem	8#	#	
Total		#	#

Olin/FMC	Post-Acquisition Share	#	#
	Post-Acquisition HHI	#	#
	Pre-Acquisition HHI	#	#
	Increase in HHI	702	

(CX 652-K#)

577. In the United States isos-only market, based upon capacity, Olin's share increased from # #% to # #% after the acquisition. (CX 652-A#) And the HHI increased by 1114, from # # to # #. (CX 652-A#)

578. The two-firm concentration ratio increased from # #% to # #%, and four-firm concentration ratio increased from # #% to # #%. (CX 652-A#)

579. Similarly, based upon production, Olin's share in the isos-only market increased from # #% to # #% and the HHI increased by 702, from # # to # #. (CX 652-K#)

580. The two-firm concentration ratio increased from # #% to

#%, and the four-firm concentration ratio from # #% to # #%. (CX 652-K#) [131]

581. For both capacity and production market share tables, historical imports have been used as a proxy for the United States capacities of foreign companies. (CX 652-Q,R#)

3. Market Shares and Concentration and Import Competition

a. *Substantiality of Imports*

582. In evaluating the significance of the marked increases in the post-acquisition market shares and seller concentration in the two relevant markets, it is important to assess accurately the true competitive impact of the historically substantial imports in these markets.

583. The following tables, reformatted from corresponding market share tables discussed hereinabove, highlight the substantiality of import competition in the relevant markets in 1984 and 1985, ranging between 8.9% and 19% under various measures of market shares:

Table 1.

1985 United States Market Capacity Isocyanurates Thousands of Pounds

<u>Company</u>	<u>Rank</u>	<u>Post-Acquisition Capacity</u>	<u>% of Total</u>
Olin	1#		#
Monsanto	2#		#
FMC	—	—	—
Imports		23,005	14.4%
Shikoku #	#		
Nissan #	#		
Others #	#		
Total		160,026	100%

(Based on CX 652-A#) [132]

Table 2.

1984 United States Production

Isocyanurates

Thousands of Pounds

Pre-Acquisition

<u>Company</u>	<u>Rank</u>	<u>Capacity</u>	<u>% of Total</u>
Olin	3#		#
Monsanto	1#		#
FMC	2#		#
Imports		23,005	19.0%
Shikoku #	)#		
Nissan #	)#		
Others #	)#		
Total		121,245	100%

(Based on CX 652-K#) [133]

Table 3.

1985 United States Market Capacity

Isocyanurates and Calcium Hypochlorite

Thousands of Pounds

Post-Acquisition

<u>Company</u>	<u>Rank</u>	<u>Capacity</u>	<u>% of Total</u>
Olin	1#		#
PPG	2#		#
Monsanto	3#		#
FMC	—	—	—
Imports		34,930	8.9%
Shikoku #	#		
Nissan #	#		
Nippon Soda #	#		
Toyo Soda #	#		
Others #	#		
Total		390,163	100%

(Based on CX 652-C#) [134]

400

Initial Decision

Table 4.

1985 United States Market Capacity
Isocyanurates and Calcium Hypochlorite
Thousands of Pounds

Post-Acquisition

<u>Company</u>	<u>Rank</u>	<u>Capacity</u>	<u>% of Total</u>
Olin	1#		#
PPG	2#		#
Monsanto	3#		#
FMC	—	—	—
Imports		34,930	9.6%
Shikoku #	#		
Nissan #	#		
Nippon Soda #	#		
Toyo Soda #	#		
Others #	#		
Total		359,163	100%

(Based on CX 652-D#) [135]

Table 5.

1984 United States Market Production
Isocyanurates and Calcium Hypochlorite
Thousands of Pounds

Pre-Acquisition

<u>Company</u>	<u>Rank</u>	<u>Capacity</u>	<u>% of Total</u>
Olin	1#		#
Monsanto	2#		#
FMC	3#		#
PPG	4#		#

Initial Decision

113 F.T.C.

Imports	33,730	12.1%
Shikoku #	#	
Nissan #	#	
Nippon Soda #	#	
Toyo Soda #	#	
Others #	#	
Total	280,173	100%

(Based on CX 652-M#) [136]

Table 6.

1984 Isos + Calcium Hypochlorite
(United States Production and Foreign Imports)
Average Bulk Prices

<u>Company</u>	<u>Dollars</u>	<u>% of Total</u>
Olin	#	#
FMC	#	#
Monsanto	#	#
PPG	#	#
Imports	42,473,500	13.1%
Shikoku #	#	
Nissan #	#	
Nippon Soda #	#	
Toyo Soda #	#	
Others #	#	
Total	\$323,074,400	100%

(Based on CX 652-P#)

584. Also, a number of witnesses estimated the level of imports of isos and cal hypo to have been from 18 to over 20% of domestic sales in recent years. There is no serious dispute regarding the quantitative substantiality of imports in the relevant markets in this case. There is also testimony indicating that 1986 iso imports were comparable. (Marcum, Tr. 3977-78; Hughes, Tr. 5279; Kosche, Tr. 8548#) In any event, the evidence indicates that the impact of these imports on domestic pricing of isos and cal hypo has been substantial and that repackers often sought lower prices from domestic producers by citing a lower price from a foreign producer. (Schaub, Tr. 2091-92; Smith, Tr. 6675; RX 252#) There is also testimony suggesting that some large repackers are buying imported isos and cal hypo as a secondary

source of supply. (Bloom, Tr. 737-38#; Kennedy, Tr. 512, 516-17; Castagnoli, Tr. 2427; Christensen, Tr. 1707-08#; Jonas, Tr. 2316#; Schaub, Tr. 2109-10; Vonderlow, Tr. 4803-05) However, the quantitative substantiality of imports should be evaluated along with other relevant factors disclosed in the evidence. Such factors, discussed hereinbelow, serve, individually and collectively, to diminish the potential influence of foreign producer-importers to respond to small but significant and nontransitory price increases and otherwise to constrain noncompetitive behavior by the remaining domestic producers in the future. [137]

b. *Recent Iso Dumping Proceedings and Their Impact*

585. Olin appears to contend that because of their capacity, production and substantial exports to the United States market in recent years, the Japanese producers will effectively restrain any anticompetitive behavior, including restriction of output and price increases to a supracompetitive level.

586. Inasmuch as the Japanese isos and cal hypo producers/exporters have accounted for the bulk of United States imports of isos/cal hypo in recent years, it is reasonable to look to them as the principal source of import constraints upon any anticompetitive behavior, including responses to any small but significant and nontransitory price increase. Therefore, a review of the impact of recent ITC-DOC anti-dumping proceedings and imposition of anti-dumping duty margins upon certain Japanese isos and cal hypo producers, including Nissan Chemical and Shikoku Chemical, is appropriate in order to evaluate the Japanese import competition more realistically in light of these experiences.

587. In June, 1983, Monsanto filed a petition with the ITC and the DOC alleging that CA and its chlorinated derivatives (isocyanurates) were being sold in the United States at less than fair value, and that an industry in the United States was materially injured or threatened with material injury by reasons of imports of such merchandise. (CX 174-I#; CX 179-Z13) Olin filed a brief supporting Monsanto's petition. (CX 376#) Olin did not support the Monsanto petition with respect to cyanuric acid (CA). (Turnipseed, Tr. 7702)

588. On November 18, 1983, the DOC made a preliminary determination, pursuant to Section 731 of the Tariff Act of 1930, that there was a reasonable basis to believe or suspect that CA and its chlorinated derivatives were being imported into the United States

from Japan at less than fair value (CX 179-Z13) and directed the Customs Service to require Japanese importers to post a cash deposit or bond equal to the average weighted margin between the United States purchase price and the Japanese market price for subsequent shipments of CA (except CA from Nissan) or one of its chlorinated derivatives. (CX 179-Z14)

589. On February 29, 1984, the DOC made a final determination that imports of CA and its chlorinated derivatives from Japan were being sold in the United States at less than fair value, and directed the Customs Service to continue the bond requirements. (CX 179-Z13-Z14) [138]

590. And, on April 17, 1984, the ITC made a final determination, pursuant to Section 735(b) of the Tariff Act of 1930, that an industry in the United States was materially injured by reason of imports from Japan of CA and its chlorinated derivatives. (CX 179) And the Customs Service was directed to assess anti-dumping duty margins on all entries of Japanese isocyanurates in the following amounts:

Nissan		
	Dichlor	32.40%
	Trichlor	8.84%
Shikoku		
	Dichlor	32.00%
	Trichlor	21.40%
Other Japanese Producers		
	Dichlor	32.20%
	Trichlor	16.58%
(CX 179-Z14)		

No such anti-dumping duty was imposed on cyanuric acid imported into the United States by Nissan. (CX 179-Z14)

591. A request for an accelerated review of the order with respect to Japanese isos under Section 736 of the Tariff Act was opposed by Monsanto (CX 201) and no accelerated review was instituted. (Kugelman, Tr. 1241)

592. Neither the DOC's determinations nor the ITC's determinations regarding CA or its chlorinated derivatives resulted in the imposition of any quota or other quantity limitation on the amount of CA or its chlorinated derivatives that could be imported into the United States from Japan or any other country. (Kugelman, Tr. 1276)

593. In September, 1986, the DOC terminated the bond require-

ments imposed on November 18, 1983, on Nissan's United States imports of chlorinated isocyanurates and reduced significantly the bond requirements imposed on Shikoku's United States imports of CA and its chlorinated derivatives. (Preliminary Results of Anti-dumping Duty Administrative Review, *Cyanuric Acid and Its Chlorinated Derivatives from Japan*, ITA (DOC), 51 Fed. Reg. 32, 675 (1986) (Inv. No. 731-TA-136))

594. On December 19, 1986, the DOC published the results of a final determination regarding (1) the actual margins collectable with respect to Nissan and Shikoku imports of the designated products for the period November 1, 1983 to [139] March 31, 1984; and (2) estimated weighted margins for future imports of such designated products for these companies. The following weighted average margins were found to exist:

<u>Manufacturers/producers/exporters</u>	<u>Weighted Average Margin (percentage)</u>
Nissan:	
Dichlor	0
Trichlor	0
Shikoku:	
Cyanuric acid	1.74
Dichlor	9.66
Trichlor	0.66
All other manufacturers/producers/exporters:	
Cyanuric acid	1.74
Dichlor	9.66
Trichlor	0.66

(Final Results of Anti-dumping Duty Administrative Review, *Cyanuric Acid and Its Chlorinated Derivatives from Japan*, ITA (DOC), 51 Fed. Reg. 45,495, 45,497 (1986) (Inv. No. 731-TA-136); Kugelman, Tr. 1265-66)

595. A finding of zero margins in an administrative proceeding indicates that, for the period reviewed, the DOC has found that the importer had not sold at less than fair value in the United States. (Kugelman, Tr. 1248) Thus, with respect to the above finding, Nissan would not have to post any cash deposits after December 19, 1986, and Shikoku would be required to pay 0.66% in duties for its trichlor imports for the six-month initial review period. (Kugelman, Tr. 1267-68, 1289-90)

596. On May 1, 1987, the DOC published the results of a final determination regarding (1) the actual margins collectable with respect to Nissan and Shikoku imports of the designated products for the period April 1, 1984 to March 31, 1985 and (2) estimated weighted margins for future imports of such designated products for these companies. The following weighted average margins were found to exist: [140]

<u>Manufacturers</u>	<u>Weighted Average Margin (per cent)</u>
Nissan:	
Dichlor	0
Trichlor	0
Shikoku:	
Cyanuric acid	0.18
Dichlor	0
Trichlor	0

(RX 395)

This determination has been appealed to the Court of International Trade by Monsanto.

597. As a result of this final determination, neither Nissan nor Shikoku will have to make cash deposits during the next review period. (Kugelman, Tr. 1271-72) To date, Nissan has not paid any dumping duties during the pendency of the proceeding and Shikoku only had to pay a much more limited duty on its imports than initially found (*e.g.*, 0.66% on its trichlor imports) for a single six-month period. (Kugelman, Tr. 1274-75) ICI America's Mr. Pettoruto testified that if a zero margin was finally determined, Shikoku will not have to deposit anything and prior cash deposits will be refunded. (Pettoruto, Tr. 1432-34#)

598. And, if during the next review period (April 1, 1985 to March 31, 1986), both Shikoku and Nissan are determined to have an average weighted margin of zero again (or less than 0.5%), both could petition for revocation of the antidumping order. (Kugelman, Tr. 1272) In addition, during the entire time period when the revocation proceeding is pending, neither Nissan nor Shikoku would be required to post cash deposits. (Kugelman, Tr. 1285) The DOC "would intend to complete that review [*i.e.*, for the April 1, 1985 to March 31, 1986 period] by the end of May, 1988." (Kugelman, Tr. 1270-71)

599. The evidence is clear that Japanese manufacturers of isos have

taken a more cautious attitude toward the United States market following the ITC anti-dumping decisions. This attitude is reflected in documents and testimony from representatives of the Japanese producers and their United States importers, as well as in documents and testimony from domestic producers and United States customers.

[141]

600. Mr. Norihisa (Ken) Ishida, the general manager of Shikoku Chemical's United States subsidiary, was called as a witness by complaint counsel and testified concerning the impact of the anti-dumping decision on his firm. (Ishida, Tr. 923-25, 991-99, 1003-04, 1006, 1085-89, 1100-03) Mr. Ishida described the anti-dumping restrictions as a "hardship" (Ishida, Tr. 924), which he explained meant Shikoku's pricing in the United States "is not any more independently free . . . if the price in the U.S. goes down drastically, we may not be able to meet the competition because our price has to keep up with the Japanese home market price." (Ishida, Tr. 995)

601. Mr. Ishida also testified that Shikoku has a policy of reducing its United States sales as a part of its total sales. (Ishida, Tr. 923-24) He testified that Shikoku was # # (Ishida, Tr. 1085#)

602. Mr. Ishida further indicated that Shikoku regulates both the price and the volume of its United States exports more carefully than before. (Ishida, Tr. 991) He referred to the dumping order as "a limitation on the volume" (Ishida, Tr. 1006) and testified that # # (Ishida, Tr. 1102#) It is also Mr. Ishida's opinion that the anti-dumping order against Shikoku will remain in effect for approximately ten years before it is revoked. (Ishida, Tr. 998)

603. Mr. Ishida testified that Shikoku would follow an Olin increase in the price of dry sanitizers, because Olin is a "stronger force" than Shikoku and because it would be "the easier action to follow" Olin's pricing. (Ishida, Tr. 1004)

604. Shikoku documents confirm Mr. Ishida's testimony. A January 6, 1986 report from Mr. Ishida to Shikoku's Tokyo office reflects Shikoku's inability to discount prices to its United States customers. (CX 566-C) # # (Ishida, Tr. 1087-89#) # # (CX 573-D#) # # (CX 574-C#) and its own inability to # # (CX 577-F#) [142]

605. Documents and testimony from ICI, the exclusive importer of Shikoku isos in the United States, confirm the testimony of Mr. Ishida. Nicholas Pettoruto, ICI's product manager for water treatment chemicals, testified that # # (Pettoruto, Tr. 1392-94#) Mr. Pettoruto testified that # # (Pettoruto, Tr. 1393#) In Mr. Pettoruto's view,

(Pettoruto, Tr. 1427-28#) # # (CX 127-G, J#) and in other ICI documents which # # (CX 133; CX 134#; CX 137; CX 142; CX 143#; CX 144; CX 145; Pettoruto, Tr. 1537-39)

606. Nissan, the second largest importer of Japanese isos, # # Akio Toraya, general manager of Nissan's specialty chemicals division, was deposed by counsel for both parties in Tokyo and his deposition testimony has been received into evidence by stipulation of the parties. (CX 676#) # # (CX 242-B#; CX 676-Z127-Z28#), Mr. Toraya # # (CX 676-Z128#) Nissan # # (CX 676-Z133#)

607. Mr. Toraya also testified that, # # (CX 676-Z202#), # # (CX 676-Z203#)

608. Nissan's concerns were also conveyed to # # [143] (CX 251-X#; CX 792-B#; CX 794-C#) # # (Swartley, Tr. 7381#; Turnipseed, Tr. 7905-06#) # # (CX 251-X#; CX 792-B#; Turnipseed, Tr. 7906#)

609. Earlier, in June, 1983, shortly after the Monsanto petition was filed, Nissan had expressed concern over the long-run implications for its United States market position. (CX 190) Nissan statements # # (CX 240-F,G#)

610. A representative of Toyomenka, Akira Kuroda, was deposed by counsel for both parties in Tokyo and offered similar testimony on the effects of the anti-dumping proceedings. Mr. Kuroda stated Toyomenka # # (CX 677-Z81#) # # (CX 677-Z190-91, Z194#), # # (CX 677-Z193#)

611. # (CX 617#) Another # # (CX 619-B#; CX 677-Z188-89#)

612. # # (CX 590-B#) Kitagawa, Tr. 2385-86) Also, # # (CX 596-B#; Kitagawa, Tr. 2384)

613. Documents of domestic producers confirm that the Japanese are less of a force in the United States marketplace as a result of the anti-dumping decision. Olin reported this in its 1984 report to its shareholders as having a positive impact on Olin's swimming pool chemicals business. (CX 678-U) [144] # # (CX 262-B#) Olin's George Turnipseed stated his observation, based on information from Olin's marketing personnel, that the Japanese were less aggressive in the United States after the anti-dumping decision. (CX 654-L-N) Olin's Peter Kosche estimated # # (CX 476-Z26-Z27#) Olin reported # # (CX 423-A#)

614. Monsanto also foresaw # # (CX 220-A#) Later Monsanto documents confirm # # (CX 213-D# CX 223-A#) Monsanto concluded that # # (CX 222-A#) and # # (CX 226-F#)

615. The management witnesses from FMC, Monsanto and PPG, testifying at Olin's instance, indicated the anti-dumping ruling had a significant impact on the United States market. John Furrer of FMC acknowledged that the ITC anti-dumping ruling on isos helped firm up domestic pricing by preventing the Japanese from selling at low prices in the United States. (Furrer, Tr. 3388, 3529) Michael Marcum of Monsanto also acknowledged that the anti-dumping ruling was a significant event in improving profitability (Marcum, Tr. 4007) and that, after the anti-dumping decision, Japanese prices were the same as domestic prices. (Marcum, Tr. 4013) Richard Hughes of PPG, also acknowledged that iso prices went up after the anti-dumping ruling. (Hughes, Tr. 5262-63) A PPG strategy document estimates iso prices went up by 15% after the anti-dumping decision. (CX 548-D)

616. A number of repackers who purchase and resell isos have offered similar testimony concerning the impact of the anti-dumping proceeding on Japanese iso suppliers to the United States market. Donald Wilson of Hasa, called as a witness for respondent, testified that the anti-dumping ruling "caused a tremendous upheaval and shortage." (Wilson, Tr. 4270-71) Other witnesses confirmed that the Japanese have taken a much more cautious approach to the United States since the imposition of the anti-dumping restrictions. (Kennedy, Tr. 520-21, 549; Bloom, Tr. 767-68; Christensen, Tr. 1849-51, 1940-41; Jonas, Tr. 2252) [145] Mr. Christensen of Chem Lab testified, in response to cross-examination by counsel for Olin, that he now finds it impossible to bargain with his Japanese suppliers below a certain price. (Christensen, Tr. 1941) Charles Schaub of Coastal testified that imported isos are no longer priced below domestic product since the ITC anti-dumping ruling. (Schaub, Tr. 2088) A major distributor in New England who was called as a witness by Olin testified that he has not been solicited by anyone selling Japanese product since the anti-dumping decision. (Arakelian, Tr. 5984-85)

617. A March, 1984 document of Great Lakes Chemical Co. conveys an expectation of increased prices once the ITC action is finalized. (CX 92-B) An October, 1984 document confirms the existence of two iso price increases since the anti-dumping decision the preceding April. (CX 111-C) Another Great Lakes document reflects a picture of cautious, "fearful" Japanese suppliers as early as August, 1983, a few months after the anti-dumping action was instituted. (CX 117-B)

618. It is the perception of many observers in the industry that the substantial increases in the price of isos in the United States in 1984

and 1985 were attributable to the iso anti-dumping decision. (Jonas Tr. 2252; Sossamon, Tr. 4666; Smith, Tr. 6738; Spiegel, Tr. 6852; Turnipseed, Tr. 7803-04) Mr. Polkowski, then with FMC and now with Olin, factored in price increases for FMC's iso swimming pool sales as a result of the anti-dumping ruling. (CX 478-Z10) Olin's Peter Kosche # # (CX 476-Z29#) Olin internal documents # # (CX 349-B#)

619. Documentary evidence shows that the post-dumping iso price increases were led by the domestic industry and followed by sellers of the Japanese imports. On April 24, 1984, shortly after the anti-dumping order was finalized, ICI announced a price increase (CX 131-C; CX 568-F) following an earlier increase by Monsanto (CX 131-U; CX 568-G) and FMC. (CX 568-H) Later that year, Monsanto announced a second increase to \$1.45 per pound on August 31, 1984 (CX 131-S-T; CX 568-D), followed by FMC on September 13, 1984 (CX 568-B), ICI on September 27, 1984 (CX 131-B; CX 568-A), and Toyomenka on October 1, 1984. (CX 568-E)

620. The evidence indicates that the transaction prices also went up. (CX 125-J#; CX 231-E#; Marcum, Tr. 4184, 4816#; Turnipseed, Tr. 7803-04#) Mr. Marcum of Monsanto testified that # # (Marcum, Tr. 4213-14#) The record reveals several instances of Monsanto TVAs prior to [146] 1984. (CX 191-B-D#) Marshall Bloom of Bio-Lab, the largest repackager of isos, stated that his iso bulk transaction prices have risen since 1984. (Bloom, Tr. 828) One of Olin's witnesses observed a 25 to 30% increase in iso prices at the retail level after the 1984 anti-dumping decision. (CX 755-B)

621. Dr. Ordovery, Olin's economic expert, concluded that the 1984 and 1985 iso price increases were largely the result of the anti-dumping decision. (Ordovery, Tr. 9198-99) During cross-examination, he agreed that the anti-dumping restrictions have caused the Japanese to watch their pricing in the United States more closely than before. (Ordovery, Tr. 9662)

*c. The Recent Cal Hypo Anti-Dumping Proceedings
and Their Impact*

622. After reviewing Olin's April 15, 1984 petition (CX 377-A#), the DOC determined that it contained sufficient grounds upon which to initiate an anti-dumping investigation with respect to cal hypo imported from Japan under the amended Tariff Act and notified the ITC of its action. (CX 177-Z20)

623. Subsequently, on October 9, 1984, the DOC issued a preliminary determination that cal hypo from Japan was being, or was likely to be, sold in the United States at less than fair value and announced the imposition of margins to be assessed against future imports of all Japanese-produced cal hypo. (CX 176-Z24) As of that date, imports of Nippon Soda, Toyo Soda and Nankai cal hypo were subject to the posting of bonds or cash deposits in amounts equal to the volume of each company's product imported, multiplied by the dumping margin designated for that company. (CX 176-Z25) On February 27, 1985, the DOC issued a final determination that Japanese imports of cal hypo were being sold in the United States at less than fair value and announced final dumping margins for imports of Japanese cal hypo. (CX 176-Z29)

624. In April, 1985, the ITC made a final determination that an industry in the United States was materially injured by reason of imports from Japan of cal hypo. (CX 176) On April 17, 1985, the DOC issued an anti-dumping duty order against importers of Japanese cal hypo. As of that date, Japanese calcium hypochlorite could only be imported subject to the posting of cash deposits based upon the volumes of imported product and the final dumping margins imposed.

625. The following anti-dumping duty margins were imposed on Japanese importers of cal hypo on April 17, 1985: [147]

Nippon Soda	20.01%
Toyo Soda	0.9%
Other Japanese	
Cal Hypo Producers	12.29%

(CX 176-V) The firm Toyo Soda is referred to in the ITC reports as Nisshin Denka, a subsidiary of Toyo Soda. (CX 176-V; CX 177-Z3)

626. The cal hypo anti-dumping proceedings have had an adverse impact on the Japanese producers-importers selling cal hypo in the United States. # # (CX 677-Z163#) # # (CX 677-Z164#)

627. Also, indicating that cal hypo prices were expected to rise as a result of an anti-dumping ruling against the Japanese importers, PPG projected stabilized prices in the United States and intensified competition overseas as the result. (CX 549-C-D) A Great Lakes document predicted price increases and supply problems. (CX 111-C)

628. Olin's Mr. Turnipseed also # # (CX 471-Z8#) Mr. Turnipseed suggested that the Japanese increased their price of cal hypo in # # (CX 471-Z8-9#)

629. The 1985-1986 strategic plan of ICD, an importer of Japanese cal hypo, indicates that the anti-dumping proceedings have had an adverse impact on both Nippon Soda and its United States cal hypo marketer, Toyomenka. (CX 121-A)

630. Mr. Hughes of PPG stated that it was his perception that Japanese cal hypo imports have declined significantly from levels before the anti-dumping decision. (Hughes, Tr. 5296) Mr. Hughes projects that sales of Japanese cal hypo will not increase to pre-dumping levels. (Hughes, Tr. 5296-97; *see also* CX 548-S)

631. Some repackers also confirmed that the cal hypo anti-dumping ruling has had an adverse impact on Japanese cal hypo producers and resellers of Japanese cal hypo in the United [148] States. (Christensen, Tr. 1849-50; Jonas, Tr. 2252) Cal hypo prices have gone up as a result of the anti-dumping action (CX 30-E; Collins, Tr. 3888), but not to the same extent as iso prices. (Jonas, Tr. 2247, 2252)

d. Impact of Yen/Dollar Exchange Rate on Import Competition

632. Exchange rates are a relevant factor in assessing the extent to which foreign firms are able to influence competition in the United States. *DOJ Guidelines* § 3.23. The more volatile the relevant exchange rate, the more significant the potentially adverse effects from a domestic merger can be. Ordover and Willig, *Perspectives on Mergers and World Competition*, *supra*, at 203. As a general rule, foreign producers provide less competition to domestic producers when the value of the foreign producers' currency increases relative to the United States dollar. (Kamerschen, Tr. 2711-12; Ordover, Tr. 9665)

633. The economic experts of the parties both acknowledge that the volatile nature of the yen/dollar exchange rate is a factor to be considered in assessing the competitive significance of the Japanese producers of isos and cal hypo that sell their products in the United States. (Kamerschen, Tr. 2711-13, 3139-40; Ordover, Tr. 9261-62, 9659) The yen/dollar exchange rate constrains the producers in Japan (Ishida, Tr. 1000-01) as well as the resellers of the Japanese products in the United States. (Pettoruto, Tr. 1394)

634. The Economic Report of the President contains reliable information on the yen/dollar exchange history in recent years. The Report expresses exchange rates in terms of cents per unit of foreign currency. According to the data from the 1987 Economic Report, the value of the Japanese yen has increased from approximately 0.42

cents of United States currency in 1984 to approximately 0.62 cents of United States currency by the end of 1986. (CX 710-O) Expressed another way, this represents a shift in the exchange rate from approximately 240 yen to the dollar in 1984 to approximately 160 yen to the dollar by year-end 1986. (Ordovery, Tr. 9672-73) The yen/dollar exchange rate was in the 140- to 150-yen-to-the-dollar range by March and April of 1987. (Marcum, Tr. 4151)

635. The testimony of the witness from Shikoku Chemical, the largest Japanese exporter of isos into the United States, confirmed that the appreciation of the yen relative to the dollar has made it much harder to compete in the United States. (Ishida, Tr. 1000) The appreciation in the value of the yen has also required Shikoku to monitor much more closely the home market price of its product (Ishida, Tr. 1000-01), which is a **[149]** relevant part of monitoring compliance with the anti-dumping duty order now in place. The yen appreciation has increased the difficulty of Shikoku's pricing decisions as well. (Ishida, Tr. 1001; *see* CX 573-D#; CX 574-C#)

636. Witnesses who look to the Japanese producers-exporters as potential sources of supply have also acknowledged that the yen/dollar exchange rate is a factor, which would indicate that Japanese suppliers are unlikely to be as significant in the United States as in the past. (Kennedy, Tr. 549; Bloom, Tr. 695-96; Marshall, Tr. 1160; Jonas, Tr. 2252-53)

637. Olin and FMC corporate officials also acknowledge that the yen/dollar exchange rate is relevant information to be considered in assessing the competitive viability of Japanese producers-exporters. (Collins, Tr. 3777, 3785; Johnstone, Tr. 6396-97, 6402-03) In FMC's 1980 Strategic Plan, FMC noted that Nissan and Shikoku could be expected to have difficulty competing in the United States once the yen/dollar exchange rate dropped significantly below the 190 yen to the dollar level. (CX 664-Z26; RX 134-Q; Collins, Tr. 3785) A significantly lower yen/dollar exchange rate, in the 160 yen to the dollar range, would effectively increase the cost curve for both Nissan and Shikoku. (Collins, Tr. 3787-89) As Mr. Johnstone of Olin acknowledged, a 150-yen-per-dollar environment is very different from a 230-yen-per-dollar environment. (Johnstone, Tr. 6396-97) A strong dollar compared to a relatively weak yen was certainly a factor which assisted the Japanese in being more competitive in the iso business in the United States in the early 1980's. (CX 385-O; CX 481-I#; CX 664-P)

638. The significance of the exchange rate factor is also recognized in Olin's annual reports to its shareholders (CX 678-T, V; CX 679-D), FMC's strategic planning documents (CX 664-P, Z26, Z29), and PPG planning documents. (CX 547-E) Exchange rates were also a factor taken into consideration in cyanuric acid supply contracts # # (CX 811-B#)

639. Information obtained from Shikoku, the largest Japanese iso producer, indicates that its iso sales to the United States declined from 1984 to 1985, which is a period of time when the value of the yen was appreciating relative to the dollar. (CX 710-O) Imports of Japanese cal hypo to the United States also declined during this same time period. Nissan's sales of isos into the United States showed a decline for the first half of 1986 compared with the first half of 1985, again corresponding to a period when the value of the yen was appreciating relative to the dollar. (CX 710-O) Dr. Ordovery, respondent's economic [150] expert, acknowledged that import data he reviewed showed Japanese imports of isos declining in the last half of 1986 compared to the same time period in 1985, also a period when the yen was appreciating relative to the dollar. (CX 710-O; Ordovery, Tr. 9679)

640. According to Dr. Kamerschen, complaint counsel's economic expert witness, future projections are that the yen will remain strong relative to the dollar for at least the next three to five years. (Kamerschen, Tr. 3140) He expressed the opinion that, while Japanese producers may be willing to absorb exchange rate differentials in the short run, they could be expected in the long run to price their products according to the exchange rate. (Kamerschen, Tr. 3142)

*e. Other Constraints On Import Competition Related to
Capacity, Cost and Historical Marketing Patterns
of Foreign Producers-Exporters*

641. Nissan and Shikoku, the two Japanese iso producers who sell in the United States, # # (CX 236-J#; CX 237-J#; CX 674-D#; CX 676-Z207#); Ishida, Tr. 966#) Shikoku's # # (Ishida, Tr. 963-64#) Shikoku # # (Ishida, Tr. 965#)

642. Nissan is # # (CX 676-Z57-60#) Nissan # # (CX 676-Z60#) Nissan would # # (CX 242-B-C#) Olin internal analyses # # (CX 651-B#)

643. Mr. Ishida of Shikoku also testified that # # (Ishida, Tr. 1077-79#) Shikoku does not face # # (Ishida, Tr. 1086#) Mr.

Marcum of Monsanto was unaware of any country other than the United States with anti-dumping restrictions in place against Japanese iso manufacturers. (Marcum, Tr. 4153) Mr. Marcum also testified that Monsanto encounters strong [151] competition from the Japanese in all of its export markets throughout the world. (Marcum, Tr. 4153) Other documents in the record reflect the commitment of Japanese iso producers to other foreign markets. (CX 33-M; CX 52-A; CX 127-H#)

644. Japanese iso producers also have high chlorine, caustic, transportation, and energy costs compared to the United States domestic producers of isos. (Collins, Tr. 3818; Henske, Tr. 7287; Kosche, Tr. 8960) # # (CX 502-S#; RX 32-M#; Turnipseed, Tr. 7883#; Fortuna, Tr. 8135-36#) An Olin internal analysis suggests # # (CX 259-R#; CX 502-Y#) Olin's Mr. Swartley concluded that # # (CX 262-B#; Swartley, Tr. 7443-45#)

645. Japanese cal hypo producers have higher chlorine, caustic, and energy costs compared to the United States producers of cal hypo. (CX 259-N#; CX 332-G#; CX 377-N#; CX 545-C; Hughes, Tr. 5244; Henske, Tr. 7244; Kosche, Tr. 8960) # # and PPG internal analyses demonstrate that the Japanese cal hypo producers did not have significant cost advantages over # # and PPG at a time when the yen/dollar situation was more favorable. (CX 332-H#; CX 545-C) PPG also suggests that two of three Japanese cal hypo producers lack cost-competitive technology. (CX 545-E)

646. The same PPG document also reports that capacity expansions were announced by the three Japanese cal hypo producers in order to deter a domestic entry of a potential fourth producer in Japan and concluded that "new capacity additions in Japan are expected to be relatively small and orderly." (CX 545-B)

647. From all of the evidence reviewed hereinabove in VI. B. 3, together with further evidence showing the difficulties experienced foreign entrants disclosed hereinafter (*see* F. 723-25, 740-45, *infra*), it is found that the evidence in this case does not support the proposition that import competition can be realistically counted on effectively and timely to respond to small but significant non-transitory price increases in the relevant markets or otherwise effectively to constrain anticompetitive behavior by the market leaders in this country. [152]

648. As for the Japanese producers-exporters, the evidence is persuasive that even when and if the anti-dumping duty margin

orders are revoked eventually, Japanese iso/cal hypo producers-exporters are not likely to be as aggressive price competitors as they were before. The evidence further indicates that while the Japanese producers-exporters will attempt generally to maintain their historical level of participation in the United States market, they are more likely to follow price increases by the United States producers and to remain cautious in following any significant price reductions in the United States for some years to come.

*C. Certain Non-Market Share Factors Bearing on the
Effect of the Acquisition on Competition*

649. It should be noted here that although any non-market share factor that may facilitate an informed and realistic assessment of a merger's effect on competition should be carefully considered, some factors are more important than others and should be given more weight in reaching an overall assessment of the merger's effect. *See generally FTC Statement § III and DOJ Guidelines §§ 3.2—3.44.* Such factors as ease of entry and some elements of conduct of firms are more important than others. For example, ease of entry and rapid changes in market conditions or production technology may be sufficient to save an acquisition which is highly likely to lessen competition substantially on the basis of market share and concentration analysis, while some others may be of less significance especially in cases where the concentration level approaches a duopoly.

1. Vitality of the Merging Firms

650. It is well-recognized that the market shares of merging firms are the primary indicia of the present and probable future of their competitive significance in the market. It is reasonable to conclude, in the absence of substantial evidence to the contrary, that a firm's competitive strengths or weaknesses will be reflected in its market share.

651. However, it is also recognized that, while most businesses experience "ups and downs," factors related to the vitality or viability of the merging firms may establish that their market shares may significantly overstate or substantially misrepresent their present and probable future competitive significance. *See generally IV Areeda and Turner, Antitrust Law ¶ 932, ¶ 934. [153]*

652. In this case, respondent presented extensive and detailed evidence and arguments related to the pre-acquisition performance of Olin and FMC in the isos market. *See* RPF 138-367, 368-444; RB at 14-26, 27-32, 91-97.

653. In brief, the evidence indicates # #

654. Olin further contends that # # *See* F. 554-58, *supra*.

655. Olin finally contends that # # [154]

656. Respondent argues in essence that # #

657. Although Olin was # # (Fortuna, Tr. 8213-14#; *also see* Ordoover, Tr. 9793) # # *See* CPF 1254-1272.

658. In a contemporary corporate document of Olin's Water Products and Services Division of May of 1985, the Division president stated that # # (CX 474-B, C, Z2, Z7#)

659. In the final analysis, however, the record does not show, nor could Olin seriously contend, that CA was unavailable or that it was losing its only economical CA supply. On the contrary, the evidence shows that # # *See* IV Areeda and Turner, *Antitrust Law* (1980), ¶ 934d. [155]

660. The evidence shows that Olin was able to purchase adequate supplies of cyanuric acid with which to operate its Lake Charles, Louisiana trichlor plant. Olin purchased the following amounts of CA, in thousands of pounds, for use in manufacturing isos at its Lake Charles facility:

1980	#	#
1981	#	#
1982	#	#
1983	#	#
1984	#	#

(CX 440-A#)

In the 1982 to 1984 period, most of Olin's CA purchases were from Nissan. (CX 440-A#; CX 585-A-E#; RX 50-A#) Olin purchased CA from Nissan through its United States broker, Sumitomo Corporation of America. (Kitagawa, Tr. 2337)

661. In 1980-84, Olin purchased the following quantities of CA from Nissan through Sumitomo:

Initial Decision

113 F.T.C.

	<u>Metric Tons</u>	<u>Pounds</u>
1980	#	#
1981	#	#
1982	#	#
1983	#	#
1984	#	#

(CX 585-A-E#; Kitagawa, Tr. 2338) One metric ton is 2,204.6 pounds. (Turnipseed, Tr. 7775)

662. Nissan's total capacity to produce CA for the 1980 to 1984 time frame was as follows:

	<u>Metric Tons</u>	<u>Pounds</u>
1980	#	#
1981	#	#
1982	#	#
1983	#	#
1984	#	#

(CX 234-H#)

663. Olin's internal strategic planning documents which discuss CA supply concluded that # # (CX 265-B#; CX 266-G#; CX 268-R#) [156]

664. Olin's projections of the worldwide supply and demand situation for CA showed # # (CX 269-P#; CX 502-Q#)

665. Olin also acknowledged to the ITC that # # (CX 375-R#) Documents prepared in 1983 show that # # (CX 269-P#; CX 502-Q#) Olin's Mr. Swartley testified that # # (Swartley, Tr. 7405#) One of the reasons Olin # # (CX 475-N#; Kosche, Tr. 8651-55#)

666. By early to mid-1981, Olin had concluded that # # (RX 18-G#; Turnipseed, Tr. 7486, 7756-57#) Olin's internal forecasts of CA availability, prepared in 1981, projected # # (CX 441-G#; RX 15-17#; RX 20-21#; Turnipseed, Tr. 7748-53, 7757-59#)

667. In 1981, # # (CX 441-F#; Turnipseed, Tr. 7747-48#) Olin # # (CX 811#; Turnipseed, Tr. 7815-17#) # # (CX 811-A#; Turnipseed, Tr. 7817-18#) # # (CX 811-A#; Turnipseed, Tr. 7834-35#) # # (CX 811-A#; Turnipseed, Tr. 7818, 7834-35#)

668. In 1982, # # (Turnipseed, Tr. 7818-19, 7827-28) [157] # # (CX 585-C#; RX 50-A#; Turnipseed, Tr. 7819#) In June, 1982, Olin informed # # (RX 15#; RX 16#), that Olin was # # (CX 781-A#; Turnipseed, Tr. 7826-27#) In September, 1982, Olin wrote # # (CX 741#; Turnipseed, Tr. 7828-29#) At that same time, Olin advised # # (CX 741#; CX 811-A#; Turnipseed, Tr. 7835#)

669. In January 1983, Nissan had # # (CX 782-B#; Turnipseed, Tr. 7833#) In 1983, Olin # # (RX 50-A#; Turnipseed, Tr. 7835-36#) Thus, # # (CX 811-A#; RX 50-A#; Turnipseed, Tr. 7836#)

670. The 1984 CA supply agreement # # (RX 49-C#; Swartley, Tr. 6950#) # # (RX 49-C#; Swartley, Tr. 6952#) # # (RX 49-C#; Swartley, Tr. 7048#)

671. Olin projected # # Swartley, Tr. 6966#)

672. # # (RX 49-A#; Turnipseed, Tr. 7797-98#) This would have been [158] # # (CX 269-Z49#; CX 502-S#; RX 32-M#; Turnipseed, Tr. 7798#; Kosche, Tr. 8679#) # # (Kosche, Tr. 9009#) # # (CX 474-Z9#; Swartley, Tr. 7051#)

673. The evidence shows that # # (Turnipseed, Tr. 7812, 7819, 7836-38#; Swartley, Tr. 7030)

674. Mr. Turnipseed recalled # # (Turnipseed, Tr. 7633-35, 7812) # # (CX 251-Z1#)

675. Mr. Turnipseed testified that # # (Turnipseed, Tr. 7810-13#)

676. In January of 1984, Mr. Kosche # # (RX 30-B#)

677. In April of 1982, # # (Turnipseed, Tr. 7820#) In June of 1982, # # (CX 248-F#; CX 316-A#; CX 739#; Turnipseed, Tr. 7820#) # # (CX 248-F#; CX 316-A#; CX 739#; Turnipseed, Tr. 7821-23#) [159] # # (CX 248-F#; CX 316-A#; CX 739#)

678. The total amount of CA which Olin believed would be available # # (CX 441-H, I#; CX 799#; Turnipseed, Tr. 7823#) This amount was # # (CX 266-P#) The Olin memo reflecting # # (CX 739#)

679. Olin's Mr. Swartley # # (CX 656-Z33-34#) Mr. Swartley # # (Swartley, Tr. 7041-42#)

680. Olin and Nissan notes # # (CX 251-Z2#; CX 792-C#) # # (CX 251-Z2#) # # (CX 676-Z14-15#)

681. Nissan notes [160] # # (CX 251-Z3#; CX 792-D#; CX 676-Z19-Z20#)

682. Nissan's Mr. Toraya expressed the view that, from Nissan's perspective, # # (CX 676-Z200-Z201#; *see also* CX 242-B#)

683. Nissan considered # # (CX 242-A#) Olin's Mr. Swartley has acknowledged that # # (CX 656-Z51#; Swartley, Tr. 7407-08#)

684. The record also shows that Olin was aware of other possible CA sources. A Taiwanese firm, Taiwan Ivy, is referred to in Olin documents as having excess CA available for sale. (CX 645-A) In April of 1984, # # (CX 325-A#; Turnipseed, Tr. 7863-64#) Olin was also approached by # # (CX 324#), # # (Turnipseed, Tr. 7873-74#)

685. Furthermore, Olin's cost for purchasing cyanuric acid before the FMC acquisition # # (CX 267-F#; Kosche, Tr. 8676-77#)

686. By 1983, Olin's # # (CX 502-S#), # # (CX 502-L#) In 1983, Olin's **[161]** # # (CX 502-S#) # # (CX 387-B#)

687. # # (RX 32-M#; Fortuna, Tr. 7980#) # # (Fortuna, Tr. 8023, 8125#) # # (CX 440-A-B#; RX 137-A-C#; Fortuna, Tr. 7965#)

688. # # (CX 401-A#; RX 49-A#; Turnipseed, Tr. 7797-98#)

689. # # (CX 401-A#; RX 49-A#) # # (CX 401-B#; CX 403#; CX 655-M; CX 656-Z30-Z31#; Turnipseed, Tr. 7916-18#; Kosche, Tr. 8502, 8922#) # # (CX 707-Z34#)

690. By using cyanuric acid produced at the South Charleston, West Virginia, facility, Olin incurs a diseconomy in the form of additional bagging and freight costs to transport this raw material to its Lake Charles trichlor plant. The shipping alone can amount to several cents per pound. (Fortuna, Tr. 8220; Kosche, Tr. 9008-09)

691. Olin's yield efficiency at its Lake Charles trichlor plant could # # Olin viewed itself as a competitive producer of trichlor. # # (CX 794-A#) # # (CX 749-A#) **[162]**

692. According to the financial analyst assigned to Olin's pool chemical business, # # (Fortuna, Tr. 8034#) # #

693. Comparing Olin's cost of purchased cyanuric acid with other producers' manufacturing costs is not a valid comparison, because it does not consider return on capital or risks. Olin's cost of cyanuric acid is # # (RX 137-B#) # # (Fortuna, Tr. 7978-79#)

694. Olin planned to spend about # # (CX 661-P#; RX 32-Z15#; Fortuna, Tr. 7989-90#)

695. Olin recognized that # # (CX 259-P#; CX 269-Z2#)

696. During the anti-dumping proceedings, Olin told the ITC that cyanuric acid price # # (CX 375-R, S#)

697. The record also shows that Olin had considerable leverage in negotiating a favorable CA price than # # (Turnipseed, Tr. 7813#)

698. Mr. Swartley testified that, during his tenure, # # (Swartley, Tr. 7052#) And, **[163]** # # (CX 656-Z31-32#; Turnipseed, Tr. 7813#)

699. # # (CX 811-A#; Turnipseed, Tr. 7816-17, 7834-35#) # # (CX 740#; Turnipseed, Tr. 7829-31#) # # (Turnipseed, Tr. 7831#) # # (RX 50-B#) # # (CX 742-A#; RX 50-B#; Turnipseed, Tr. 7831#) # # (RX 50-A, B#) # # (CX 782-B#; Turnipseed, Tr. 7832-33#)

700. Mr. Turnipseed reported that the # # (CX 742-B#) # # (CX 742-B#; Turnipseed, Tr. 7847-48#)

701. # # (CX 269-Z2#) # # (CX 387-B#)

702. # # (RX 50-A#; Swartley, Tr. 7053-54#) # # (Swartley, Tr. 7054#) # # (Swartley, Tr. 7054#), # # (RX 49-C#; RX 50-A#; Swartley, Tr. [164] 7054-55#; Turnipseed, Tr. 7799-7800#)

703. Olin's CA prices in 1984 # # (Turnipseed, Tr. 7800-04#)

704. # # (RX 50-B#) # # (RX 50-B#) In October, 1983, # # (CX 787#; Turnipseed, Tr. 7849-51#)

705. In response to a hypothetical question, Dr. Ordovery, Olin's expert witness, agreed that an illustration of the exercise of "buyer power" would be a situation where a buyer was able to successfully negotiate a 25% price reduction, forcing the seller to cut his profit margin by a substantial amount in order to sell the product. (Ordovery, Tr. 9730-31) The January, 1983 negotiations # #

706. From the foregoing, it is found that adequate supplies of CA were available to Olin, that Olin's alleged CA cost disadvantage was rather minimal, and that Olin's isos business remained viable at the time of the challenged acquisition.

707. The record further shows that Olin's claimed CA cost disadvantage was not decisive in terms of total isos cost, and that, in any event, Olin's CA cost was more than offset by # # as well as by Olin's in-house production of other essential input chemicals, such as chlorine and caustic. Indeed, the evidence shows that no isos manufacturer in the United States was fully integrated, producing in-house all the essential input materials that go into the production of CA and isos.

708. As regards FMC, its pre-acquisition performance is discussed in F. 399-438, *supra*. For the purposes of our discussion here, it suffices to say that the evidence does not show that FMC's market shares significantly overstate or substantially misrepresent the competitive significance of FMC in the relevant markets. [165]

709. From the foregoing, it is found that the factors related to the vitality of the merging firms fail to establish that their market shares significantly overstate or substantially misrepresent the competitive significance of the merging firms in the relevant markets or that market shares are not a reliable predictor of the probable effects of the challenged acquisition.

2. Entry Barriers to the Relevant Markets Are Substantial

710. It is well-recognized that, although the analysis of a challenged

acquisition begins with the definition of a relevant market and measurement of the concentration in that market, the Commission also looks to other qualitative considerations that bear on the likelihood of anticompetitive effects. And, the most important of these non-market share considerations is the existence of entry barriers. *See generally FTC Statement Concerning Horizontal Mergers* Section III; *DOJ Guidelines* §§ 3.21—3.45; *Echlin Mfg. Co.*, 105 FTC 410, 483-84 (1985) (“Echlin”).

711. Thus, the Commission has stated in *Echlin* that “an acquisition is not likely to have substantial anticompetitive effects if the evidence shows that there are no barriers to entry, regardless of the level of concentration that is present in the relevant market.” 105 FTC at 487.

712. In the case at hand, the evidence is clear that there are high entry barriers into the manufacture and sale of isos in the United States. With respect to cal hypo, the evidence suggests that there are significant entry barriers into the production and sale of that product in the United States. And, as for the dry pool chemicals market encompassing isos and cal hypo, the evidence shows that there exist overall substantial entry barriers. In any event, the record as a whole shows that the existence of substantial entry barriers in the relevant markets is likely to exacerbate any market power conferred by the acquisition. Thus, the challenged acquisition cannot be saved by entry conditions.

713. Dr. Ordovery, Olin’s economic expert, stated, his opinion, based on his review of relevant record evidence, that entry barriers into isos production are high and “almost insurmountable.” (Ordovery, Tr. 9739) Dr. Kamerschen, complaint counsel’s economic expert also concluded that there are significant entry barriers in the manufacture and sale of isos. (Kamerschen, Tr. 2270-73)

714. John Henske, Olin’s board chairman and CEO, testified that a new entry into the manufacture of trichlor would [166] require ten years and that the entrant’s difficulties would include designing a new technology around existing patents and successfully overcoming safety hazards associated with such a venture (Henske, Tr. 7310-11)

715. Dr. Marano, vice president of technology for Olin’s Chemicals Group, estimated that # # (CX 472-M-N#) And Robert Yohe, president of Olin’s Chemicals Group, suggested, based on Olin’s own experience, that even for a firm experienced in commercial chemical production such as Dow and du Pont, entry into isos production would

require three to five years. (CX 473-N) This is well in excess of the two year standard in the *DOJ Guidelines*. *DOJ Guidelines* § 3.3.

716. Olin documents also acknowledge that development of manufacturing technology for isos is # # (CX 259-G#) Technology to manufacture isos is described as # # (CX 264-D#)

717. Olin's experience with its Lake Charles, Louisiana trichlor plant is instructive in assessing the amount of time required for a new entrant into the business of isos production on a full-scale basis. After several years of design work, the trichlor pilot plant was constructed in 1973 and ran until 1976 or 1977. (Henske, Tr. 7106) Construction of a full-scale facility was authorized in 1977. (Henske, Tr. 7108) # # (CX 441-N#; RX 35-B#) The trichlor production at the facility was eventually suspended in July, 1984.

718. There are high capital costs associated with entry into the manufacture of isocyanurates. Olin estimates a plant construction cost in the range of # # per pound of nameplate capacity for trichlor. (CX 443-A#) One repacker who investigated the possibility of producing isos provided a capital cost estimate of \$2.00 per pound of production capacity. (Christensen, Tr. 1863) # # (CX 453-B, F#) Olin's Mr. Yohe estimated \$120 to \$130 million for a firm such as Dow or du Pont seeking to enter the isos business, based on Olin's own experience. (CX 473-N) Olin has estimated the [167] # # (CX 441-A#) Olin has concluded that # # (CX 259-G#) PPG's Richard Hughes estimates # # (Hughes, Tr. 5231-32#)

719. Olin has acknowledged that # # (CX 443-A#) Monsanto's Michael Marcum agreed there are high fixed costs involved in the manufacture of isos. (Marcum, Tr. 4174)

720. Olin's economic expert agreed that the sunk costs involved in the production of isos are "substantial." (Ordoover, Tr. 9740) Olin's financial analyst said he treated Olin's costs at Lake Charles as "sunk." (Fortuna, Tr. 8284) Dr. Ordoover agreed that high sunk costs can be an impediment to entry. (Ordoover, Tr. 9740)

721. Dr. Kamerschen, complaint counsel's economic expert, testified that the existence of economies of scale might be inferred from the existence of high fixed costs along with a reading of the perceptions of some industry members. (Kamerschen, Tr. 2777) According to Dr. Kamerschen, scale economies make it more difficult for smaller firms to have a competitive impact. (Kamerschen, Tr. 3151-52)

722. Olin has estimated that # # the optimum size for a new isos

plant. (CX 443-D#) Monsanto's Michael Marcum, in June of 1986, estimated 20 million pounds of plant capacity are required to achieve scale economies. (Marcum, Tr. 4144)

723. According to a March, 1984 FMC report, Sigma Prodotti Chimici, SpA of Italy ("Sigma") spent ten years looking at the isocyanurate business and developing proprietary technology. (CX 13-A) Sigma's entry was announced in December, 1983 (CX 636), with a plant start-up projected for some time in 1985. (CX 324#) It was not until early 1986 that Sigma had obtained its EPA registration and begun selling isos in the United States. (CX 567-B; CX 638; CX 643-C) Sigma reportedly had manufacturing start-up difficulties and quality problems extending into 1986. (Schaub, Tr. 2093; Jonas, Tr. 2253; Marcum, Tr. 4044, 4165) It has been estimated that it might take a firm such as Sigma five years or longer to develop a track record as a reliable supplier of isos to the marketplace before it can make inroads with significant repacker customers. (Jonas, Tr. 2265)

724. Iso producers seeking to sell isos for pool use in the United States must have their products registered and approved for use by the EPA. (CX 443-A#; Marcum, Tr. 3969) Toxicological data required to meet EPA requirements can be [168] obtained through membership in an industry Ad Hoc Committee. (CX 443-A#; Marcum, Tr. 3969) Members of the Ad Hoc Committee share in the expense of developing the toxicity data, which have cost a total of \$2.5 million and taken a decade to develop. (Marcum, Tr. 3971) FMC has described the EPA registration process as "EPA barriers to entry" eliminating any "overnight surprises in the U.S." market. (CX 664-Z4)

725. To date, no firm has marketed isos for pool sanitization use in the United States without first becoming a member of the Ad Hoc Committee. (Pettoruto, Tr. 1382) Mr. Ishida of Shikoku testified that it took two years for his firm to become a member of the Ad Hoc Committee. Shikoku paid \$500,000 for the membership. (Ishida, Tr. 980) The EPA requirements have been cited as a reason why Nippon Soda does not sell isos in the United States. (CX 323-B#)

726. The record also contains evidence of sporadic and aborted attempts at entry into the iso manufacturing business. In the early 1960's, Allied Chemical reportedly built a pilot plant but never went into the full scale production of isos. (Christensen, Tr. 1763-64) In 1979-81, a Taiwanese firm built a small scale iso plant (CX 645-A-B) that is no longer considered operational. (CX 5-A; CX 33-C; CX 651-B#)

727. As for cal hypo, Dr. Kamerschen, complaint counsel's economic expert, concluded that there are significant entry barriers into the manufacture and sale of cal hypo. (Kamerschen, Tr. 2270-73) The time required for entry into the manufacture and sale of cal hypo in the United States is well in excess of the two-year standard in the *DOJ Guidelines*. *DOJ Guidelines* § 3.3.

728. Olin's Mr. Turnipseed has stated that a learning curve is involved in the development of calcium hypochlorite manufacturing technology. (CX 471-S#) His opinion is that # # (CX 471-R#) Mr. Turnipseed suggested that # # would be more realistic for accomplishing such an objective. (CX 471-S#)

729. Olin's Vice President of Technology, Dr. John Marano, stated that # # (CX 472-X#) Dr. Marano's opinion is that it would take # # (CX 472-Z3#) Dr. Marano's # # related to the time needed for a new firm to reach the start-up stage for a new facility. [169] (CX 472-Z4#)

730. Olin documents also acknowledge that development of manufacturing technology for cal hypo # # (CX 259-G#) Technology to manufacture cal hypo is described as # # (CX 264-D#)

731. Process patents held by incumbent cal hypo manufacturers can be a significant barrier to entry into cal hypo production. (Hughes, Tr. 5253) Olin, PPG, and two of three Japanese cal hypo producers (Nippon Soda and Toyo Soda) reportedly hold such patents. (Hughes, Tr. 5253)

732. PPG's experience in constructing its Natrium, West Virginia plant is instructive in assessing the time that may be required for a new firm to enter the cal hypo business on a large-scale basis. PPG began development of the manufacturing process now used at Natrium in 1978 and a pilot plant was constructed two years later, in the fall of 1980. (Hughes, Tr. 5247) Full-scale plant construction commenced in December, 1981. (CX 552-G#; Hughes, Tr. 5247) The plant had start-up difficulties (CX 548-F, G) and did not begin to produce cal hypo on a routine basis until October, 1984. (Hughes, Tr. 5247) # # (CX 552-G#) Thus, six years were required for PPG to develop the technology, build the plant, and achieve production at its Natrium facility.

733. Mr. Hughes testified that it would take a new entrant somewhat longer to develop and construct a cal hypo processing plant than the time required for PPG, a firm with thirty years of experience as a cal hypo producer, with the Natrium facility. (Hughes, Tr. 5249)

734. In response to a specific inquiry during the course of the FTC's investigation of the Olin/FMC acquisition, # # CX 443-B#)

735. Olin's Dr. Marano has stated that # # (CX 472-Z4#)

736. The calcium hypochlorite production process has been described by Olin's Mr. Turnipseed as "relatively difficult" and involving high fixed costs. (CX 173-K) Mr. Turnipseed has [170] estimated # # (CX 471-P#) and does not include the time to develop the technology, achieve satisfactory levels of production and gain market acceptance.

737. There are also high capital costs associated with entry into the manufacture of cal hypo. # # (CX 443-E#) # # (CX 259-G#) In 1984, Olin estimated a replacement cost # # (CX 377-N#) PPG's capital investment in its new Natrium facility is approximately \$60 million. (Hughes, Tr. 5248)

738. There are high fixed costs associated with the manufacture of cal hypo. (CX 377-N#; Hughes, Tr. 5289)

739. Olin's CEO Mr. Henske has testified that # # (Henske, Tr. 7243#) # # (Henske, Tr. 7244#)

740. The record with respect to the time required for the new Canadian producer, Saskatoon, is rather sketchy but it suggests that site preparation was underway as early as 1981. (CX 467-A) Plant construction commenced in May, 1982. (CX 467-A) Saskatoon announced it was entering into production in late 1983. (CX 173-Z49) Saskatoon reportedly had start-up difficulties, including a fire in the plant, which delayed its entry into the marketplace. (CX 175-Z65-66; CX 177-Z3-4; CX 467-A; CX 471-O#; Schaub, Tr. 2015; Hughes, Tr. 5251) Olin concluded that Saskatoon # # (CX 416-P#), # # (CX 334-A#; CX 466#)

741. Saskatoon's plant is apparently based on inferior technology, similar to that employed unsuccessfully in Yugoslavia. (CX 426-D-E; CX 467-A) Olin's Dr. Marano has stated that # # (CX 472-Z1#)

742. PPG's # # [171] (Hughes, Tr. 5239, 5241#) # # (Hughes, Tr. 5240-41#)

743. Cal hypo producers must have their products registered and approved for use by the Environmental Protection Agency ("EPA") in order to sell cal hypo for pool use in the United States. (CX 443-B#; Hughes, Tr. 5183) EPA registration for calcium hypochlorite could take from one to three years. (Hughes, Tr. 5183) Toxicological data required for EPA registration are generally publicly available. (CX 443-B#)

744. There is evidence that expansion of existing calcium hypochlorite production capacity is not easy. Nippon Soda has estimated that two years are required for expansion of existing facilities. (CX 373-B; CX 388-B) Olin's Dr. Marano # # (CX 472-Z5#) Olin # # (CX 441-B, E-G#)

745. There have been failed attempts to enter into the manufacture and sale of cal hypo. A firm known as Toa Gosei of Japan reportedly abandoned an effort to build a 22 million pound cal hypo facility in 1982. (CX 323-A#) Firms in France and Yugoslavia have also attempted unsuccessfully to enter cal hypo production. (CX 173-Z24; CX 377-T-U)

746. Wesley Industries, Inc., ("Wesley") has reportedly been attempting to produce cal hypo at a small plant in Demopolis, Alabama, as a by-product of its agricultural chemicals business. (CX 173-W-X) Wesley's imminent cal hypo production has been an industry rumor for four or five years. (Hughes, Tr. 5252-53, 5361) Wesley reported producing approximately 74,000 pounds of cal hypo during the first five months of 1985 (CX 675-A), although the company's cal hypo capacity is reported at 1.2 million pounds per year. (CX 675-A) # # (CX 335-A#; CX 358#) # # (CX 355-A#) However, no industry witness has reported having seen any Wesley cal hypo being offered for sale for pool use in the United States. (Kennedy, Tr. 502; Christensen, Tr. 1851; Jonas, Tr. 2255; Castagnoli, Tr. 2433)

747. Technical problems appear to have delayed indefinitely Wesley's commencement of sustained production and sale of cal hypo in the United States. (CX 173-J; CX 340#; CX 377-G#; CX 381-D) Wesley's cal hypo is reportedly an inferior product. (CX 334-A#; CX 344-B#) Olin and PPG question whether [172] Wesley should even be considered a viable cal hypo producer. (CX 341#; CX 385-F; CX 476-Z37#; CX 548-B; Hughes, Tr. 5252, 5361)

748. Even after commencing production and obtaining EPA registration, a firm must establish a track record as a reliable supplier of acceptable quality material. It has been estimated that it might take up to five years for a supplier new to the marketplace such as Saskatoon to establish such a track record before it can make inroads with significant repacker customers. (Jonas, Tr. 2265) One pool store owner indicated that it took ten years for a supplier of Japanese cal hypo to attract even 10% of his business. (Wetzel, Tr. 5381, 5412)

749. The record reflects the 1979 exit of a domestic firm in the

production and sale of cal hypo for pool use. Pennwalt Corporation ("Pennwalt") operated a cal hypo production facility at Wyandotte, Michigan for many years (at least since 1956). (CX 177-S; Schaub, Tr. 2084; Hughes, Tr. 5251) Pennwalt marketed cal hypo as a swimming pool sanitizer under the SENTRY label. (CX 543-A, L; Christensen, Tr. 1762) In 1979, Pennwalt ceased production and closed its facility, citing a pessimistic assessment of the market and Pennwalt's position as a high-cost producer, with costs expected to increase. (CX 177-S) The Pennwalt plant was acknowledged to be an antiquated facility that was having difficulty meeting pollution standards. (CX 177-S; CX 543-Z4; Schaub, Tr. 2199) A plant fire may have been the immediate cause for Pennwalt's exit decision. (CX 543-Z4; Hughes, Tr. 5251)

3. The Acquisition Eliminated Substantial Direct Competition and Made Olin a Dominant Firm

750. Although the principal aim of Section 7 is to protect "competition" and not "competitors" as such, when a substantial direct competition involving a unique, innovative or resourceful competitor is absorbed by a rival firm resulting in the elimination of substantial direct competition, the end result may well be a substantial lessening of competition within the meaning of Section 7.

751. The evidence shows that at the time of the acquisition, Olin and FMC not only were competing manufacturers of dry sanitizer but also were vigorous competitors in the sale of branded product to the lower levels of the distribution chain. Olin and FMC, moreover, were the only two manufacturers to follow consumer marketing strategies. FMC's SUN brand of iso sanitizers and Olin's PACE and HTH brands of, respectively, iso and cal hypo sanitizers were (and are) the only three pool sanitizer brands backed by consistently high levels of [173] advertising and promotional expenditures and the only three brands with real nationwide distribution. The record is replete with evidence on the significant head-to-head competition between Olin and FMC preceding the acquisition, from 1980 through 1984. And, the aggressive competition between Olin and FMC had a salutary effect on price.

752. Olin's John Johnstone, who succeeded John Henske as CEO, # # (Johnstone, Tr. 6471#) Olin's George Turnipseed # # (Turnipseed, Tr. 7810#) Mr. Turnipseed # # (Turnipseed, Tr. 7819#; *see also* CX 471-Z24#) Olin documents # # (CX 264-A#; CX 267-C, F#; CX 270-M#; CX 461-B#; CX 462#; CX 499-F, P, Z10#; CX 880-O, W, Z3, Z4, Z21#)

753. In a September, 1981 competitive analysis of FMC's iso business, # #. (CX 880-O-P#) Other Olin documents which assess market penetration of branded sanitizer sales # # (CX 277-I#; CX 431-B#) *Also see* CX 267-C#; CX 311-Y#.

754. The competition between Olin and FMC is reflected in the marketing and advertising efforts of the two firms. (CX 545-G) Olin advertising for PACE was directed at FMC's SUN product. (CX 733; Scott, Tr. 5827-28) # # (CX 880-W#) Olin and FMC were reportedly spending millions to aggressively promote PACE and SUN in 1982. Olin's Peter Kosche has # # (Kosche, Tr. 8659#)

755. Industry observers who testified at trial described the extensive pre-acquisition competition between Olin and FMC. Most of these observations related to the aggressive direct head-to-head competition between Olin's PACE brand and FMC's SUN brand. *E.g.*, Marshall, Tr. 1121-22; Christensen, Tr. 1890; Schaub, Tr. 2107; Jonas, Tr. 2260; Castagnoli, Tr. 2460-61, 2481-82; Collins, Tr. 3572; Marcum, Tr. 4159; Wilson, Tr. 4314-16; Aston, Tr. 4516; Vonderlow, Tr. 4846, 4857; Wetzel, Tr. 5442; Hammersmith, Tr. 6115; Kent, Tr. 6583. The competition between [174] Olin and FMC contributed to a lowering of iso prices in the marketplace. (Christensen, Tr. 1811-12; Jonas, Tr. 2261)

756. The degree of head-to-head competition or rivalry between two firms is a relevant consideration in merger analysis. (Kamerschen, Tr. 2654; Ordover, Tr. 9741) Economic models have shown that a combination of two firms with respective market shares of 20 and 11% that were previously rivals might have the same effect on prices as a merger of two firms with shares of 11% and 42% that were neutral in terms of their rivalry. (Ordover, Tr. 9743; Ordover, Sykes and Willig, *Herfindahl Concentration, Rivalry, and Mergers*, 95 Harv. L. Rev. 1857 [1982] at 1869) In situations where an especially uncooperative entrepreneur is eliminated, a theoretical merger of firms with the same shares of 20% and 11% could have the same effect as a merger of firms with 11% and 64%. (Ordover, Tr. 9744; Ordover, Sykes and Willig, *op. cit.*, at 1870)

757. Dr. Ordover, respondent's economic expert, agreed that there was rivalry between Olin and FMC in the sale of branded isos from 1980 to 1984. (Ordover, Tr. 9749) Dr. Ordover also agreed that FMC perceived Olin as a rival and, similarly, that Olin perceived FMC as a rival in the years preceding the acquisition. (Ordover, Tr. 9751)

758. Dr. Kamerschen, complaint counsel's economic expert, con-

cluded that the elimination of direct, significant head-to-head competition between Olin and FMC was an aspect of the acquisition that was of special competitive concern. (Kamerschen, Tr. 2654)

759. Apart from ease of entry, certain other factors affect the likelihood that the acquisition will create, enhance or facilitate the exercise of market power. Such factors include conduct of firms in the market, market dynamics including the nature and extent of price competition, homogeneity of the relevant product and demand elasticity, among others.

4. Conduct of Firms in the Market

a. *Product Exchanges or Swaps and Raw Materials Tolling Arrangement Between Firms*

760. The record discloses a clear inclination for mutual accommodation or interdependent behavior rather than independent behavior among the firms in the market. Such practices include product swaps or exchanges between competing producers-sellers apparently designed to accommodate mutual needs. [175]

761. For example, the evidence shows that Nissan Chemical, a major producer-exporter of isos into the United States, accounting for about # #% of the U.S. isos market, entered into arrangements to supply Olin, the # # U.S. competitor with about # #% of that market, with CA, a key input material for the production of isos, for some five years until Olin acquired FMC's CA production technology and facilities in 1985. *E.g.*, CX 440-A-B#; CX 585-E#; Kitagawa, Tr. 2338; Turnipseed, Tr. 7755#.

762. The record also suggests that product swaps and exchanges between firms in the market are not an uncommon occurrence. *E.g.*, CX 174-Z-157#; CX 478-V-W#; CX 519#; CX 520-523#; Collins, Tr. 3825-26, 3870.

763. The tolling agreement entered into between Olin and Monsanto to commence on July 1, 1984, for an initial term of 2½ years and its genesis and background revealed in the record are instructive in that it indicates the willingness to enter into formal product tolling arrangements on the part of two major competitors in the market.

764. When Olin management decided to suspend its trichlor production at the Lake Charles plant in July, 1984, Olin's capability to continue marketing isos in the United States had been assured by a raw materials tolling agreement entered into between Olin, the third-ranked producer-seller of isos with # #% of that market, and

Monsanto, the second-ranked producer-seller of isos with # #%. John Johnstone, then an Olin corporate vice-president and a member of the CEO office, initiated the negotiations leading to the Monsanto Toll by contacting a high level Monsanto executive in or around January of 1984. (Johnstone, Tr. 6273, 6279)

765. Under the agreement, Olin agreed # # (CX 469-A, B, H, I#) The initial term of the agreement was # # (CX 469-B#)

766. # # [176] (CX 469-B-C#; Marcum, Tr. 4170)

767. # # (CX 469-S-T#)

768. The Olin-Monsanto agreement was the culmination of an extended consideration by Olin to # # In January, 1983, in a paper entitled "Pace Option," Olin's John Swartley described the general strategy: # # (CX 327#)

769. This Pace Option paper stated that # # (CX 327#)

770. Discussion of Olin's shutdown/supply option is also found in Olin's 1983 Pool Chemicals Strategic Plan, dated July 21, 1983 (CX 259-E#), which states the conclusions of its # # (CX 259-Q#) The Plan # # (CX 259-U-X#) # # (CX 259-W#)

771. In October, 1983, Mr. Swartley made a presentation [177] # # (CX 396-D#; Swartley, Tr. 7427#) The presentation contained # # (CX 396-I#) Mr. Swartley # # (Swartley, Tr. 7429-30#)

772. Monsanto's apparent interest in "shutdown economics" is reflected in a November 30, 1982 Olin internal memo, which reported Monsanto's inquiry as to whether Olin was "committed to Lake Charles production as opposed to a shut-down proposal on cyanuric acid and chlorinated products." The Olin response was that "the only thing we are committed to [is] making money." (CX 534)

773. Olin's 1984 PACE Strategic Plan presentation in April, 1984, reflected that # # (CX 261-C#) The 1984 PACE presentation projected that # # (Compare CX 261-E# with CX 261-G#)

774. A financial analysis of the waterbatch/toll plan was prepared # # (CX 659-A#) According to that analysis, # # (CX 659-A#) # # (CX 659-E#)

775. Mr. Swartley # # (Swartley, Tr. 7430#) Mr. Swartley acknowledged that the expected impact of the toll agreement was # # (Swartley, Tr. 7431#) Mr. Swartley # # (Swartley, Tr. 7432#)

776. During the subsequent negotiations, Monsanto's negotiators were able to conclude that a successful toll agreement would result in Olin's closing of the Lake Charles [178] trichlor plant. (CX 846-J-O)

At the initial negotiating session in February, 1984, the Olin officials, John Swartley and Frank Aiken, proposed that Olin buy 15 million pounds of isos from Monsanto each year for the next two years. (CX 846-L-M) The Monsanto officials realized that the Olin negotiators were asking for a volume equivalent to Olin's annual isos sales. (CX 846-M; Marcum, Tr. 4170) On the basis of the proposal by Swartley and Aiken, the Monsanto officials "obviously drew a conclusion that they [Olin] were interested in not manufacturing for a period of time" (CX 846-N) As one of the Monsanto negotiators explained, "I did not think they were going to double their market sales. I felt they were not going to produce." (CX 846-N) That Olin was suggesting a temporary shutdown of Lake Charles was all the more obvious to Monsanto's negotiators since they were aware that Olin's trichlor plant had a capacity of 25 million pounds, but that Olin was operating it at about only a 50% utilization rate and therefore had the "capabilities to produce this much additional" volume without buying from Monsanto. (CX 846-N)

777. The Toll Agreement did not lower Olin's iso costs. # # (CX 263#) A mid-December 1984, PACE Business Review presentation # # (CX 263-A#; Fortuna, Tr. 8178-89#) This December, 1984, Board of Directors presentation # # (CX 263-V#; Fortuna, Tr. 8182-83#)

778. Dr. Ordover, Olin's expert witness, testified:

I expressed the view frequently that tolling agreements have the potentiality for anti-competitive consequences. For example, if Monsanto and Olin were to negotiate a trichlor price which is very high, that might enable Monsanto to raise its price as well and it might also induce other firms to elevate their prices.

(Ordover, Tr. 9769)

779. Dr. Ordover acknowledged that his view of the Monsanto Toll Agreement as procompetitive might change if Olin's tolling costs were actually higher than its manufacturing costs using purchased CA. (Ordover, Tr. 9768) He conceded that, in [179] any event, it would have been more beneficial for competition if Olin had continued operation of Lake Charles rather than negotiating the Toll Agreement. (Ordover, Tr. 9771)

780. There is substantial evidence of isos shortages in the market in 1984-1986 when the Toll Agreement was in effect. *E.g.*, CX 76-C; CX 133; CX 137; CX 175-Z38P-Q; CX 406#; CX 407#; CX 563-A; CX 564; CX 569-D; CX 570-D#; CX 604-B; CX 614-A, C#; CX 615-A#;

CX 668-D#; CX 670-A; CX 677-Z90, Z180#; Ishida, Tr. 1081-83. Repackers attributed this shortage to the Toll Agreement. (Bloom, Tr. 716; Christensen, Tr. 1803-08; Jonas, Tr. 2247-48; Castagnoli, Tr. 2428-29) In fact, Monsanto placed its iso repacker customers on allocation and was not able to fulfill its supply commitments during the period of the Tolling Agreement. (CX 640; Marcum, Tr. 4036) Olin's Peter Kosche agreed that the Toll Agreement contributed to the isos shortage. (Kosche, Tr. 8499#)

781. Olin officials have acknowledged that the tolling arrangement, coupled with the shutdown of Olin's Lake Charles trichlor facility, # # (Henske, Tr. 7255-57#; Swartley, Tr. 7430-32#) Olin's economic expert acknowledged that the tolling, along with the ITC anti-dumping order, # # (Ordover, Tr. 9720, 9771, 9776-77#)

b. *The Nature and Limits of Price Competition
In the Relevant Markets*

782. Vigorous price competition among firms in the market generally suggests that the market is performing competitively. The evidence in this case is somewhat mixed. In brief, the early period (before 1984) is marked by price leadership; iso prices were led by Monsanto and cal hypo prices, by Olin. During this period, the Japanese imports were, to a limited extent, a disruptive element especially with respect to bulk sales to some large repackers. The institution of isos and cal hypo dumping proceedings in 1983, and subsequent adverse determinations and imposition of anti-dumping duty margin requirements on Japanese isos and cal hypo, put an effective end to price disruptions emanating from that source. Thus, 1984 appears to have effectively restored the historical price leadership of Monsanto (in isos) and Olin (in cal hypo). During the post-acquisition period (1986 and 1987), Olin appears to have been an aggressive price competitor, selectively discounting some prices to some large buyers. To this extent, the historical price leadership by the two has arguably been somewhat eroded. However, what will be in store once the Klieg light is removed from Olin is not known. What is known at this time is that Olin [180] achieved market power through the challenged acquisition and that the relevant markets are characterized by certain collusion facilitating features. See F. 793-821, *infra*.

783. The evidence shows that pool chemicals producers generally issue almost identical or very close list price schedules in late

September through October for the following pool season, and that the prices firm up by November when the NSPI national convention is held. During this period, major producers feature the so-called early-buy programs when the rivalry for the large-volume purchases of large buyers appears to be intense. The early-buy generally runs from November through the following April, when early-buy allowances, volume discounts and TVAs (temporary voluntary allowances) are employed. The record as a whole, however, shows that the majority of sales transactions in the industry are made at list prices and that selective price concessions made to some large repackers do not result in general price reductions. *E.g.*, CX 175-Z2; CX 476-Z24#; Wilson, TR. 4260. *Also see* F. 823-29, *infra*.

784. For example, following the ITC anti-dumping ruling in April, 1984, all major iso producers increased their iso bulk list prices in the United States to an *identical* \$1.30 per pound. (CX 32-A; CX 111-C; CX 113-B; CX 131-C, U; CX 220#; CX 568-F-H; Marcum, Tr. 4181) Olin increased its cal hypo prices by 10% during that same period. (CX 113-C) Later in 1984, a second round of price increases occurred, with the result that iso bulk list prices of all major producers increased to \$1.45 per pound (for trichlor). (CX 32-A; CX 111-C; CX 131-B, S, T; CX 222#; CX 568-A, B, D, E; Marcum, Tr. 4183) Olin increased its PACE brand iso prices by 20% in late 1984 (CX 361-C) and increased its cal hypo prices by an additional 5%, followed by PPG. (CX 312#; CX 361-B; CX 482#) These price increases met with little resistance (CX 32-B; CX 482#) and caused an increase in iso and cal hypo transaction prices as well. (Bloom, Tr. 828; Pettoruto, Tr. 1360; Jonas, Tr. 2247, 2252; Marcum, Tr. 4184; Hughes, Tr. 5361; Turnipseed, Tr. 7803-04; Kosche, Tr. 8500-01, 8673-75) Monsanto also stopped # # (Marcum, Tr. 4213-14#)

785. In August-September 1985, the bulk list prices of isos and cal hypo again moved upward. On August 2, 1985, PPG announced a 10% increase in its cal hypo prices, effective September 15, 1985. (CX 681) On September 3, 1985, shortly after the Olin/FMC acquisition was consummated, Monsanto announced an increase in the bulk list price of trichlor to \$1.60 per pound, effective November 1, 1985. (CX 223-A#; CX 448-C; Marcum, Tr. 4116) On September 13, 1985, Olin increased the bulk [181] list price of FMC trichlor to an *identical* \$1.60 per pound, effective November 1, 1985. (CX 449; Marcum, Tr. 4117-19)

786. Purchasers of isos and cal hypo have acknowledged that bulk

prices of the products tend to move together (Castagnoli, Tr. 2537) and that producer price lists are always close to identical. (Schaub, Tr. 2090-91)

787. The evidence is clear that since the advent of anti-dumping proceedings in the 1983-1984 period, Japanese producers-exporters have been cautious and fearful of appearing to be aggressive price-cutters and have, evidently as a matter of policy, tended to follow the United States domestic producer prices. *E.g.*, CX 220-A#; CX 226-F#; CX 240-F, G#; CX 566-C; CX 573-D#; CX 619-B#; CX 654-L-N; CX 676-Z133, Z203#; CX 677-Z88-Z89#; Pettoruto Tr. 1392-94#.

788. Although respondent contends, largely on the basis of post-acquisition evidence, that Olin has exerted a "downward pressure" on the price of isos of late, Olin's post-acquisition evidence is less credible than its record of pricing behavior before the challenged acquisition. (See RPF 931-933; *cf* CPF 1123-1130) *Also see Hospital Corporation of America v. FTC*, 807 F.2d 1381, 1384 (7th Cir. 1986), *cert. denied*, 107 S.Ct. 1975 (1987).

789. The record also shows instances of tying by leading producer-sellers, such as Olin. Needless to say, the challenged acquisition enhances that such tying attempts may succeed, to the detriment of price competition.

790. For example, sometime around 1980, Olin reportedly used the "strength of HTH to force distribution of PACE on a national basis" by granting preferential purchase terms and co-op advertising allowances to customers who purchased both HTH and PACE in comparison to the terms and allowances granted to customers who purchased only one of those products. (CX 320-A-B; CX 541-A, B, C, F, L; Schaub, Tr. 2139) PPG's 1982 calcium hypochlorite business strategy paper, in analyzing Olin's competitive strengths, noted that "[s]ome distributors feel pressured by Olin to sell Olin's PACE brand isocyanurates in order to have an assured source of HTH" (CX 545-D) *Also see* CX 9-Z25; CX 113-C; CX 264-A#; CX 270-M#; CX 272-L#; CX 320; CX 541; Jonas, Tr. 2269.

791. According to a 1985 memo by Olin's Peter Kosche, concerning Olin's plans # # (CX 408-C#) Olin is the only [182] significant manufacturer of both cal hypo and isos. Such activities may be accelerated after the acquisition as Olin's power in the isos market is increased. (Schaub, Tr. 2203; Jonas, Tr. 2269-70; Benson, Tr. 4961)

792. Olin's enhanced strategic position as a more powerful supplier in the isos market will not only affect customers who are coerced

through tying activities but may also make rival manufacturers, which operate in only one segment or the other, less aggressive pricewise. (Ordovery, Tr. 9408-09) As Dr. Ordovery has stated in an article he co-authored:

A horizontal merger can make demand more inelastic in several ways. First, the merged firm can internalize demand shifts between the merging firms' products that are induced by price rises and that served, before the merger, as constraints on the abilities of the merging firms to elevate prices. Thus, the merged firm may have incentives to raise prices because diversion of sales is less of a threat, inasmuch as the diversion is to another of its own products. Second, the merger partners can coordinate the production and pricing of their products, thereby replacing any premerger competition with cooperation. Third, the supply and pricing decisions of the merging firms' active and potential rivals might become less competitive because of the rivals' perceptions of the merged firm's new strategic position.

(Ordovery and Willig, *The 1982 Department of Justice Merger Guidelines: An Economic Assessment*, 71 Cal. L. Rev. 535, 537 (1983))

c. The Industry Ad Hoc Committee and Unorganized Exchange of Price and Other Strategic Information Among Competitors

793. The record also discloses a number of market-wide and firm-specific characteristics which may tend to facilitate tacit or actual collusion among industry firms. They include the Ad Hoc Industry Committee and the unorganized exchange of price and strategic information among industry firms and, finally, procartel behavior of certain Japanese producers-exporters.

794. Every firm which markets isos for pool use in the United States is required first to register with the EPA certain [183] long-term toxicity test data. This data may be developed by the marketer of the product but usually is developed by the manufacturer. (CX 411-A-B#; CX 638-A; Pettoruto, Tr. 1382) A prospective registrant can develop this information on its own or can reduce the expense and avoid years of toxicity testing by joining the Isocyanurate Industry Ad Hoc Committee ("Industry Ad Hoc Committee"). (Christensen, Tr. 1868; Marcum, Tr. 3971)

795. The Ad Hoc Committee was organized sometime between 1978 and 1981 for the purpose of developing the requisite information at the shared expense of the Committee members. (CX 411-A#; Marcum, Tr. 3970-71) The Committee has spent \$2.5 million to develop this information and is still in the process of completing

toxicological studies begun at about the time of the Committee's organization. (Marcum, Tr. 3971, 4161)

796. The initial Committee members were Olin, FMC, Monsanto and ICI. Nissan and Shikoku joined sometime thereafter and in any event by mid-1983. (CX 411-A#) FMC dropped out of the Committee subsequent to the Olin acquisition, and Sigma joined in late 1985 or early 1986. There have been no other changes in Committee membership. (Marcum, Tr. 3971) Shikoku spent two years trying to join the Committee and paid \$500,000 for its membership. (Ishida, Tr. 980) Sigma's membership fee was \$345,714. (CX 638-A)

797. The small Industry Ad Hoc Committee is not engaged in any collusive activity. However, the evidence shows that the members of the small group are able to learn potential entry into the United States market through the Ad Hoc Committee. For example, Olin learned, through its contacts with the Ad Hoc Committee, the details of Sigma's plans to enter the United States isos market before Sigma's plant was in operation. (CX 665; Kosche, Tr. 8972) Similarly, FMC obtained advance knowledge of Sigma's entry plans through the Ad Hoc Committee. (CX 665)

798. It is well-recognized that market information is a two-edged sword, for a free market cannot function without free and efficient dissemination of relevant market information. On the other hand, organized exchange of information regarding costs, prices, capacity, output, shipments and other plans of strategic nature on a systematic basis among competitors, without economic necessity or other redeeming features is illegal and clearly incompatible with free competition. In any event, efficient market intelligence devoid of any organization or coercive mechanism may be useful and contribute to market efficiency. *See generally* Posner, *Antitrust Law: An Economic Perspective*, 135-147 (1976). [184]

799. The evidence suggests that (1) producer price lists are widely circulated and commonly available to buyers as well as to competing producers, (2) producers are able to learn about the price announcements of competitors before they are made, (3) smaller firms follow prices announced by leading firms, (4) there is unorganized yet remarkably efficient price monitoring in the market, and (5) the market is characterized by the existence of a pervasive information exchange network, all of which may contribute to price leadership and interdependent, rather than competitive, pricing in the relevant markets and tend to enhance the likelihood of tacit or actual industry collusion.

800. There is evidence that producers are able to learn the price announcements of competitors before the date of announcements. (CX 132; CX 565; CX 621#; CX 677-Z179#; RX 256#)

801. It is well recognized that collusive behavior can be facilitated by the use of announced price increases well in advance of their actual implementation. Posner, *op. cit.*, at 66.

802. It is also recognized that the existence of a system of price monitoring—where pricing information is readily available to the sellers in a particular market—is a factor facilitating tacit or actual collusion. (Kamerschen, Tr. 2800-03; Ordovery, Tr. 9730)

803. The record also indicates that the monitoring of pricing by the major firms in the markets (Olin, FMC, Monsanto, and PPG) is widespread. *See, e.g.*, CX 32; CX 111-C; CX 113-B, C; CX 131; CX 174-Z110; Z114-15, Z118, Z120#; CX 191#; CX 322; CX 357#; CX 376-H-J#; CX 377-Z23-78#; CX 476-I, V#; CX 550-A; CX 568; CX 572-D#; CX 573-D#; CX 574-C#; CX 617#.

804. In March of 1984, FMC's James Collins, then the manager of FMC's CDB business, described in the ITC the # # (CX 174-Z85#) Mr. Collins # # (CX 174-Z85#) [185]

805. The evidence suggests that producers in the dry sanitizer market have the ability to coordinate their pricing behavior in an interdependent manner. (F. 782-87, *supra*)

806. Producers in the relevant market also appear to have a generally accurate picture of transaction prices in the marketplace. (Marshall, Tr. 1167-68; Sossamon, Tr. 4612; Vonderlow, Tr. 4832) Transaction pricing information is learned from repacker customers (CX 377-Z58, Z64#; CX 511#) and by looking at customer invoices. (CX 187; CX 377-Z41, Z58, Z64#; CX 723-B#) Olin's submissions to the ITC reflect # # (CX 376-H-J#; CX 377-Z30-Z78#)

807. Also, Nissan and Olin # # (RX50-B#; RX 51-A#; Swartley, Tr. 6953-54#) In fact, # # (RX 50-A#) The reasons for # # (Swartley, Tr. 7054#)

808. The record indicates that in recent years, Monsanto has communicated its "announced" price increases informally to its repacker customers several months prior to the implementation date and well in advance of issuing the price announcement form letter. (CX 132-A-B; CX 565-A-B; CX 621#) Monsanto's price plan was then circulated through the industry and was quickly discovered by Monsanto's rivals. (CX 132-A; CX 223) Then followed virtually identical price increase letters sent by all the domestic iso producers. (CX 568-A, C-E)

809. The record also discloses numerous visits, conversations, meetings, and communications and contacts between firms in the market through which confidential business information about capacity utilization, product costs, supply and demand forecasts, future plans of actual and potential competitors, competitive assessments and other strategic market information was obtained or exchanged. See CPF 966-1026.

810. Dr. Ordoover, respondent's economic expert, observed that the swimming pool sanitizer business is "an industry in which people keep fairly close tabs on each other" (Ordoover, Tr. 9295)

811. And Dr. Kamerschen, complaint counsel's economic expert, concluded that the industry is one characterized by a lot of competitor meetings and information exchange. (Kamerschen, Tr. 2798) While information exchanges can be procompetitive in [186] competitive markets (Kamerschen, Tr. 2795-96, 2801), where the market is highly concentrated such information exchanges can increase the likelihood of tacit or actual collusion. (Kamerschen, Tr. 2801-04)

d. *Pro-cartel Behavior of Certain Japanese Producers-Exporters*

812. The Japanese Fair Trade Commission ("JFTC") found on December 27, 1982, that Nissan Chemical and Shikoku Chemical had fixed the prices of isocyanurates sold in Japan from 1977 through 1981; raising iso prices for pool use and septic tank use. (CX 238-V; Ishida, Tr. 983-85)

813. Dr. Kamerschen, complaint counsel's economic expert, testified that the JFTC decree is further evidence of an industry which could lend itself to tacit or actual collusion. (Kamerschen, Tr. 2804-05) The past record of an industry is a relevant consideration in predicting whether tacit or actual collusion is likely to occur in the future. *DOJ Guidelines* §3.44(a); Posner, *op. cit.* at 61 (1976); Kamerschen, *An Economic Approach to the Detection and Proof of Collusion*, 17 Am. Bus. L. J. 193, 201 (1979).

e. *Elasticity of Demand*

814. It is recognized that elasticity of demand for the products offered by members of a hypothetical cartel is a relevant factor in assessing the likelihood of tacit or actual collusion. (Kamerschen, Tr. 2780-82; Ordoover, Tr. 9726; Kamerschen, *op. cit.*, at 197-98; Posner, *op. cit.*, at 48, 56-57; Hay and Kelley, *An Empirical Survey of Price-Fixing Conspiracies*, 17 J.L. & Econ. 13, 15 (1974)) The more

inelastic the demand for the product, the greater the probability that firms in an industry can profitably engage in collusive behavior.

815. The evidence shows that the demand for isos and cal hypo is inelastic. The demand for pool chemicals is inelastic because the cost of the pool sanitizer is an inexpensive complement compared to the total cost of the swimming pool. (Kamerschen, Tr. 2782-84) A residential pool owner is not likely to stop using his pool or reduce his consumption of chemicals in the event of a substantial increase in the price of those products. (Pettoruto, Tr. 1490-10; Christensen, Tr. 1847; Kamerschen, Tr. 2783-84; Ordovery, Tr. 9237, 9727). [187]

f. Ratio of Fixed Costs to Variable Costs

816. The ratio of fixed costs to variable costs is also a relevant factor in assessing the likelihood of tacit or actual collusion in a particular industry. (Kamerschen, Tr. 2787-89; Kamerschen, *op. cit.*, at 200-01; Posner, *op. cit.*, at 61) Other things being equal, tacit or actual collusion is more likely to occur in an industry with high fixed-to-variable cost ratios because such high fixed costs make the risk of failure much more costly. (Kamerschen, Tr. 2787-89; Areeda and Turner, *op. cit.*, ¶ 921(b); Posner, *op. cit.*, at 61)

817. The evidence shows that there are high fixed costs associated with the manufacture of isos. (CX 443-A#; Marcum, Tr. 4174) The fixed cost to variable cost ratio in the manufacture of isos is also high. (Marcum, Tr. 4175) There are high fixed costs associated with the manufacture of cal hypo. (CX 377-N#; Hughes, Tr. 5289)

818. Dr. Kamerschen concluded that the high fixed costs associated with the manufacture of isos and cal hypo is another factor which contributes to the likelihood of tacit or actual collusive behavior by the firms. (Kamerschen, Tr. 2789)

g. Rate of Growth in the Market

819. The growth rate of a particular market has been recognized as a factor relevant to determining whether tacit or actual collusion is likely to occur. (Kamerschen, Tr. 2790-95; Kamerschen, *op. cit.*, at 200; Posner, *op. cit.*, at 61) Other things being equal, collusion is more likely to occur in markets with stagnant growth or declining demand. (Kamerschen, Tr. 2791, 2834; Posner, *op. cit.*, at 61) Empirical studies have shown that low profitability in such stagnant or slowly growing markets can be an important spur to collusion. (Kamerschen, Tr. 2791; Ordovery, Tr. 9808; Asch & Seneca, *Is Collusion Profitable?*,

58 Review of Economics and Statistics 1 (1976), cited with approval by Scherer, *op. cit.*, at 176)

820. The evidence shows that the demand for both isos and cal hypo has been growing slowly. Growth rates for both isos and cal hypo have been declining in recent years. There is evidence of dissatisfaction with low profitability on the part of firms in the market. (CX 225-B-G#; CX 230-C-F#; CX 259-Q#; RX 32-N#; RX 125-C) # # [188] (CX 174-W#; CX 377-Z8#) Olin's 1983 Pool Chemicals Strategic Plan # # (CX 259-Q#; RX 32-N#)

821. Dr. Kamerschen concluded that the stagnant or slow growth in the market, coupled with low profitability, was a factor indicating a likelihood that tacit or actual collusion would occur. (Kamerschen, Tr. 2792-95)

h. Buyer Concentration and Related Factors

822. It has been recognized that even in a highly concentrated market, the likelihood and duration of non-competitive pricing is affected by the size of buyers and the flow of orders. The presence of large buyers and infrequency of orders tend to discourage tacit or actual collusion and non-competitive prices in the market. (Kamerschen, Tr. 2779, 2806-07; Ordoover, Tr. 9730) See Areeda and Turner, *op. cit.*, ¶1918; Posner, *op. cit.* at 53-54, 59.

823. It is also recognized that except in cases where *all* buyers are large, there is a high probability that only large buyers will be able to derive full benefit from their buying power and that pressure from a small number of large buyers may not be expected to lead to general price reductions to competitive levels. See Areeda and Turner, *op. cit.*, at 90.

824. The evidence shows that there are between 30 to 40 bulk purchaser-repackers of isos and cal hypo (CX 176-W; CX 179-Z26), and the record reflects a number of instances when a "large" repacker was able to extract price concessions. See RPF 824-35. However, the evidence is clear that there are only a handful of "large" buyers in the markets and that the instances of large-buyer-induced price concessions did not lead to general price reductions.

825. In 1985, a large repacker estimated that there were about thirty-two independent repackers. Of those, the largest was estimated to have accounted for about 11.7% and six repackers, for shares of between 2 to 5%. (CX 5-B; Kennedy, Tr. 521-30, 539-45) Dr. Kamerschen analyzed the data in CX 5 and concluded that it was

evidence of a lack of countervailing buyer concentration to offset the seller concentration in the relevant markets. (Kamerschen, Tr. 2757-66)

826. In 1984, Olin's total production of cal hypo was # # (CX 441-I#) No single United States customer of Olin accounted for more than # # pounds, or approximately # #%, of Olin's total cal hypo production. [189] (CX 900-D#) In 1984, Olin's total production of trichlor was # # (CX 441-I#) No single United States customer of Olin accounted for more than # # million pounds, or approximately # #%, of Olin's total trichlor production. (CX 900-J#) Olin's customer lists (CX 900-B-T#) identify # # who purchased cal hypo, trichlor, and dichlor from Olin in each year in the 1980-1985 period.

827. A January, 1984, FMC chart of the distribution chain for its CDB swimming pool products estimates the following number of participants at each level of the distribution chain:

Producer	5
Packager	35
Distributor	70
Retailer	5000
Consumer	Millions

(CX 84-C)

828. Purchasers of isos and cal hypo who testified indicate they have little leverage in negotiating price with their producer-suppliers. (Christensen, Tr. 1817#; Jonas, Tr. 2249#) John Christensen of Chem-Lab testified that # # (Christensen, Tr. 1817#)

829. Marshall Bloom of Bio-Lab, the largest repacker (CX 5-B; Bloom, Tr. 630-31), testified that his firm has been adversely affected by industry shortages. (Bloom, Tr. 716) Bio-Lab has been unable to prevent its iso prices from rising in recent years. (Bloom, Tr. 828) E-Z Clor, another large repacker, was unable to prevent Monsanto and other suppliers from increasing prices after the 1984 ITC anti-dumping decision. (CX 203)

830. One factor relevant to an analysis of the buyer power issue is the ability of buyers to integrate backward into the production of the product being purchased. (Kamerschen, Tr. 2807; Ordovery, Tr. 9731) Repackers testified that they were not in a position to integrate backward into the manufacture of isos or cal hypo. (Bloom, Tr. 727; Christensen, Tr. 1862-66; Jonas; Tr. 2257) No repacker of isos or cal hypo has been able to successfully integrate backward. (Christensen, Tr. 1870) Dr. Ordovery testified that "it is totally impossible for a

repacker to backward integrate into isos or cal hypo." (Ordovery, Tr. 9731)

831. However, manufacturers of isos have been able to integrate forward into repacking. (Christensen, Tr. 1870; [190] Marcum, Tr. 4158-59) Monsanto, for example, has the capacity to integrate into repacking with some additional capital and marketing. (Marcum, Tr. 3965-66) It would be much easier for a manufacturer to integrate forward into repacking than it would be for a repacker to integrate backward into manufacturing. (Christensen, Tr. 1870-71; Ordovery, Tr. 9731)

832. It is recognized that the potential for buyers to exercise countervailing market power is greater in markets where there are a significant number of large transactions, such as sales pursuant to long-term contracts. Conversely, where sales in a particular market are frequent, regular, and small relative to a firm's output, tacit or actual collusion is more likely because the benefits of cheating on a collusive agreement are small relative to the potential costs. *DOJ Guidelines* § 3.42. Evidence in the record indicates that relatively few purchases of dry sanitizers are made pursuant to long-term contracts. (CX 173-Z25-Z27) However, the evidence also shows that bulk purchaser-repackers of isos and cal hypo place orders for the bulk of their estimated requirements for the following pool season during the "early-buy" period, generally from December to March/April. Thus, in terms of the nature and flow of orders, the purchases by repackers are rather infrequent.

i. *Product Homogeneity*

833. It is well-recognized that homogeneity of a particular product is a factor to be considered in assessing the likelihood of tacit or actual collusion in a particular market. For producers selling homogeneous products that buyers regard as perfect substitutes for each other, competition is largely based on price and arrangements suppressing price competition are relatively easier to reach. Product heterogeneity, on the other hand, increases the means of rivalry and can discourage or impede tacit or actual price coordination. (Kamerschen, Tr. 2784-85; Ordovery, Tr. 9727; Kamerschen, *op. cit.*, at 198; Posner, *op. cit.*, at 59-60; F. Scherer, *op. cit.*, at 176; Areeda and Turner, *op. cit.*, at 91; *DOJ Guidelines* § 3.41.

834. However, it is also recognized that product heterogeneity, while reducing the probability and magnitude of anticompetitive

effects flowing from seller concentration, does not eliminate those effects. Areeda and Turner, *op. cit.*, at 92.

835. Thus, while the relevance of product heterogeneity is recognized as a moderating element against presumptions of illegality based on market share analysis, especially at the lower end of the scale, it is not possible to determine, with any degree of confidence, what degree of product homogeneity or [191] heterogeneity will have what effect at various levels of concentration. Areeda and Turner, *op. cit.*, at 92.

836. The evidence shows that isos are relatively homogeneous products as is cal hypo. However, isos and cal hypo are clearly heterogeneous products.

837. Relevant qualitative evidence of the relative homogeneity of products includes the existence of price lists and inventories. (Kamerschen, Tr. 2785-86; Posner, *op. cit.*, at 60) Dr. Kamerschen concluded that these factors, along with evidence of product swaps, supported the conclusion that the products were "reasonably" but "not perfectly" homogeneous. (Kamerschen, Tr. 2785-86)

838. The evidence also shows that Olin and FMC expended large sums of monies to promote the HTH (isos), PACE (cal hypo) and SUN (isos) brands over the years and that private label brands are also widely used by other producers and repackers. The effects of such attempts at product differentiation upon price competition is not clear. However, it is doubtful that such private label usage would constitute a significant impediment to price coordination. The ITC investigations found price to be the major factor upon which competition is focused. (CX 176-L; CX 179-Q)

j. *Levels of Distribution at Which the Principal Firms Sell*

839. It is recognized that the feasibility of collusion is reduced when some members sell at lower levels in the distribution than others. Posner, *op. cit.*, at 60. The added difficulty to enforcement of a cartel when members sell at different distribution levels is the need for them to determine the reasonable spread between their prices. Although this factor may reduce the feasibility of tacit or actual collusion, it does not by itself make collusion unworkable or impossible. (Ordoover Tr. 9731)

840. In the instant case, the two leading domestic producers (Olin and Monsanto) sell isos, for the most part, at different levels of distribution. Monsanto sells isos in bulk to repackers, while Olin sells

to both repackers and also at further down the chain of distribution to dealers and distributors.

841. The evidence shows, however, that Monsanto is able to and does obtain a fairly accurate picture of prices and costs at the repacker level. Monsanto's repacker customers are known to have shared such information with Monsanto. [192] (Bloom, Tr. 686; Christensen, Tr. 1815; Castagnoli, Tr. 2529) # # (Christensen, Tr. 1816#)

842. There is also evidence that Monsanto knew the actual pricing differential between repacker costs and retailer costs. On one occasion, Monsanto and FMC officials discussed general industry repacking costs, after which the Monsanto official wrote that a "range of 70 cents between bulk and retail isn't a bad estimate for [r]epackers." (CX 205; CX 845-D) A FMC document confirms that FMC actually considered 70 cents to be the per-pound difference between the bulk price to repackers and the repacker/distributor price to retailers. (CX 84-A, C)

843. Repacker costs do not appear to vary significantly from one repacker to another. (CX 179-Z58) As Olin informed the ITC in March, 1984: # # (CX 376-D#) (emphasis in original)

844. Monsanto's Mr. Marcum informed the ITC in the iso anti-dumping proceedings # # (CX 174-Z15#) Mr. Marcum testified in this case that he monitors Olin prices for its branded products. (Marcum, Tr. 3989)

845. The record shows instances where Monsanto is monitoring branded prices at the branded level. (CX 4-H, J; CX 191-C-D#; CX 219-A#; Christensen, Tr. 1874-79, 1885-88) PPG, which concentrates most of its business on the sale of bulk product to repackers, also monitors prices at the branded level. (Hughes, Tr. 5199) Olin has also acknowledged a relationship between bulk and branded prices. (CX 386-G-H)

846. Viewed against the level of seller concentration resulting from the acquisition, none of the relevant non-market share factors reviewed hereinabove, either singly or collectively, operates to moderate or significantly diminish the high probability of substantial anticompetitive effects of the challenged acquisition, much less save it.

k. *Likelihood of Dominant Firm Behavior*

847. The record as a whole supports the conclusion that Olin will achieve market power after the acquisition and will be in a position to exercise it successfully. [193]

848. An October, 1983 Olin document which listed the FMC acquisition as an alternative to be considered by Olin's CEO Mr. Henske identified the following "Plusses" for the acquisition: # # (CX 396-E#; *also see* CX 396-A#; Swartley, Tr. 6980-81; Henske, Tr. 7258)

849. A December, 1984, presentation to Olin's CEO and Board of Directors recommending the FMC acquisition compared a 10-year forecast of Olin/FMC combined versus Olin and FMC as separate entities. (CX 263-H#) # # (CX 263-H#; CX 475-Z2-Z3#)

850. Analyzing the proposed FMC acquisition, Olin's John Swartley noted that # # (CX 262-E#; Swartley, Tr. 7443-44#)

851. In his testimony in this proceeding, Mr. Henske acknowledged that today Olin is the strongest firm in pool chemicals. (Henske, Tr. 7169)

852. Another defense witness testified that Olin is now in a position to exercise control in the dry sanitizer market in the sense that Olin can lower or raise prices and other companies will follow. (Wilson, Tr. 4316) Shikoku Chemicals' Ken Ishida stated his firm will follow Olin's pricing lead. (Ishida, Tr. 1004) PPG's cal hypo business manager, Richard Hughes, stated PPG will follow Olin's pricing lead. (Hughes, Tr. 5290) Other witnesses expressed the view that efforts by Olin to increase price would be followed by other producers of isos and cal hypo, most notably Monsanto and PPG. (Bloom, Tr. 712; Pettoruto, Tr. 1404; Schaub, Tr. 2117; Castagnoli, Tr. 2457-58)

853. Akira Kuroda of Toyomenka, testifying by way of deposition in Japan, stated that # # (CX 677-Z159#) Mr. Kuroda's viewpoint [194] # # (CX 613-A#)

854. Toyomenka, # # (CX 613-A#)

855. The record also reflects the views of repacker witnesses that the acquisition gave Olin the power to drive independent repackers out of business by squeezing their profit margins and to enhance its market position further. (CX 175-Z72-75; Kennedy, Tr. 530-31; Marshall, Tr. 1162-63; Christensen, Tr. 1893-99; Schaub, Tr. 2112; Castagnoli, Tr. 2537-39; Wilson (defense witness) Tr. 4328-29)

856. Monsanto # # (CX 208-A#) Monsanto listed one favorable aspect of the Olin/FMC acquisition and stated "we will have only one domestic competitor and . . . repackagers should feel Olin is even more of an end-market threat to them." (CX 209-B)

857. Dr. Kamerschen, complaint counsel's economic expert, testified that the acquisition raised dominant firm concerns, in both the dry

sanitizer market and the isos-only market. (Kamerschen, Tr. 2721-22, 2745-47)

858. A number of Olin documents which were prepared after the acquisition and after the issuance of the Complaint show that in a number of instances Olin led price reductions or met lower prices of competitors, or that Olin has been encountering increasing downward pressure from competing sellers or that import competition has increased. *E.g.*, RX 114; RX 115; RX 116; RX 119#; RX 121#; RX 123#; RX 371#; RX 372#.

859. Observers of recent declines in prices have suggested that Olin has been a leading factor in such price [195] reductions. (CX 123-B; CX 573-D#; CX 620-A-B#; CX 622-A#; Marshall, Tr. 1208; Christensen, Tr. 1983; Castagnoli, Tr. 2476-78; Sossamon, Tr. 4622-23) Donald Aston of Chem-Quip acknowledged that Olin lowered its price to meet the price of a small competitor after he was named to testify as a witness for Olin. (Aston, Tr. 4508) Olin rolled back its price to another witness to meet the price of a competitor. (Vonderlow, Tr. 4801)

860. One large repacker witness observed that the FTC challenge to the acquisition has prevented Olin from exercising market power presently but added: “[O]nce they have been assured that the acquisition is going to be completed and they turn loose the power that they have, then I think you will see prices rising.” (Castagnoli, Tr. 2456-57)

861. We have considered both pre- and post-acquisition evidence presented by Olin. However, the probability of and the weight to be given to post-acquisition evidence are much less than those of pre-acquisition evidence. *Hospital Corp. of America v. FTC*, 807 F.2d at 1384.

862. On the basis of the record evidence reviewed in VI. hereina-bove, it is found that the challenged acquisition has a high probability of lessening competition substantially in the isos-only market as well as in the dry pool chemicals (isos and cal hypo) market in the United States.

VII. RESPONDENT’S DEFENSES

A. *Olin’s Economies Defense*

863. Inasmuch as the primary objective of antitrust laws is the maintenance of competition so that economic efficiency be promoted and misallocation of resources avoided, it has been recognized that a

merger which is otherwise unlawful may be saved by establishing through substantial evidence that the merger resulted in substantial economies or significant efficiency gains and that these gains were unique to the acquisition.

864. However, in order to make an economies defense, substantial scale economies and integration economies must both be established by direct and specific proof and further significant savings in resources, and not private economies, must be shown. Thus, evidence of private economies, such as savings in production costs and other so-called cost savings are not considered unless it is clearly established that they are substantial and necessarily inure to the benefit of consumers. *American Medical International, Inc.*, 104 FTC 1, 213-20 [196] (1984). See generally Areeda and Turner, *op. cit.*, ¶948, ¶949; Kwoka and Warren-Boulton, *op. cit.*, at 433-34.

865. In this connection, it is generally recognized that pre-acquisition evidence of anticipated efficiencies is more credible than post-acquisition evidence alleged to flow from a challenged acquisition. It is fair to say that post-acquisition evidence susceptible to manipulation by the merged firms is inherently suspect. See *Hospital Corporation of America v. FTC*, 807 F.2d at 1384; Kwoka and Warren-Boulton, *op. cit.*, at 431, 435.

866. Furthermore, efficiencies defense requires that the efficiency gain, once established by substantial evidence, must be shown to be unique to the challenged acquisition. Thus, efficiency gains which could have been achieved through inter-firm managements short of merger, or through some other merger, cannot save a merger which is otherwise shown to be unlawful. Consequently, the efficiency gain that is attributable to a merger is limited to the incremental cost saving which is not available through the next best alternative. And, in order to make out that showing, the merged firm must show that it explored reasonable alternatives and that the challenged acquisition was the only feasible option. (Kamerschen, Tr. 2839-55; Kwoka and Warren-Boulton, *op. cit.*, at 433-35, 439)

867. In the instant case, Olin does not contend, nor does the evidence show, that either Olin or FMC suffered from substantial diseconomies of scale before the acquisition or that substantial scale economies or significant savings in resources were realized through the acquisition.

868. Furthermore, Olin failed to establish the alleged efficiencies by substantial evidence. It failed to establish that the claimed perfor-

mance gains were *economic* efficiencies as opposed to *private* economies. It failed to establish that the claimed "efficiencies" were unique to this particular acquisition. Most important of all, Olin failed to establish that any claimed efficiency gains or economies clearly outweigh Olin's increased market power or will necessarily inure to the benefit of consumers.

869. Our discussion of the economies defense may well end here. However, for the sake of completeness, a brief review of the state of evidence presented by respondent follows.

870. First of all, Olin's alleged efficiency gains run counter to its pre-acquisition assessment. The conclusion of Olin's pre-acquisition analysis of the FMC plant was that closing FMC's trichlor facilities and consolidating trichlor production [197] at Lake Charles would # # See CPF 1530.

871. Secondly, Olin failed to present any evidence on the basis of which the administrative law judge could make a determination with some confidence whether there in fact were any savings or whether the savings were substantial. Areeda and Turner would not consider any savings smaller than 5% of total costs. Areeda and Turner, *op. cit.*, at 168. Also see CPF 1557-58.

872. For example, Olin's economic expert testified that the essential undertaking in analyzing any cost savings resulting from the acquisition is the comparison of FMC's actual pre-acquisition costs and Olin's actual post-acquisition costs. (Ordovery, Tr. 9873) Olin presented no documentary evidence comparing actual pre- and post-acquisition manufacturing costs at South Charleston. The only documentary evidence presented by Olin concerning its actual production costs at South Charleston was a # # (RX 342) Also see CPF 1523-1525.

873. Prior to the acquisition, Olin received "all the detailed costs" associated with FMC's operating results at the South Charleston plant. (Kosche, Tr. 8506-07#; Fortuna, Tr. 8052, 8059-60#) Olin presented no documentary evidence concerning FMC's pre-acquisition-1985 performance at South Charleston. Olin presented no documentary evidence concerning FMC's budget for 1985 performance at South Charleston.

874. Olin's evidence comparing its performance at South Charleston to FMC's pre-acquisition performance consisted of undocumented, conclusory statements of Olin's Messrs. Kosche and Fortuna. (Kosche, Tr. 8535; Fortuna, Tr. 8052, 8067) Such testimonial evidence alone is hardly substantial evidence capable of establishing alleged cost

savings flowing from the challenged acquisition. *Also see* CPF 1529-1534, 1557-58.

875. Similarly, Olin failed to establish by substantial evidence that the acquisition realized substantial integration economies. In any event, "there is little ground for recognizing a defense based on (a) plant specialization economies where there is no product complementary . . . or for economies in (b) capital cost, (c) procurement, (d) overhead, or (e) the combination of complementary resources (emphasis added)." IV Areeda and Turner, *op. cit.*, at 175. [198]

876. Respondent also failed to establish, through substantial evidence, any substantial improvement in plant utilization or production capacity or any substantial physical improvement to the acquired facility. *See* CPF 1535-40, 1542-53.

877. Finally, whatever economies or efficiency gains there may be, they are not shown to be unique to the challenged acquisition for, there is substantial evidence showing that Olin simply abandoned the available alternatives when the FMC acquisition opportunity surfaced and that the main reason for choosing that route was to save itself the time it would take to pursue other alternatives.

878. For example, # # *See* CPF 1276-96.

879. The record also discloses that the possibility of a joint venture with Nissan Chemical to produce CA was very much a viable option when # # *See* CPF 1298-1322.

880. Another viable alternative, the one Olin appears to have preferred over a joint venture, was the licensing of Nissan's CA technology. # # *See* CPF 1327-42.

881. Another viable alternative was to obtain access to Sulfolane technology for the production of CA through either FMC or Chlor-Chem. In fact, # # *See* CPF 1356-76.

882. Another possible alternative open to Olin was a joint venture with Shikoku Chemical of Japan. *See* CPF 1396-1401. [199]

883. From the foregoing, it is concluded that Olin failed to establish economies defense by substantial evidence.

B. Olin's "Exiting Asset" Defense

884. Finally, Olin invokes the "exiting asset" defense, relying on Kwoka and Warren-Boulton, *Efficiencies, Failing Firms and Alternatives to Merger: A Policy Synthesis*, 31 Antitrust Bull. 431, 444-50 (1986). *See* RB at 97-101.

885. In a DOJ working paper published in 1986, Messrs. Kwoka and

Warren-Boulton advance a novel policy proposal. Focusing on “the potential for achieving efficiencies through merger” and persuaded that “much of the evidence on the correlates of higher market concentration could be interpreted to indicate that mergers result in significant economic efficiencies instead of, or as well as, market power” (emphasis added), the authors attempt to “show that the present failing firm defense should be recast into an ‘exiting assets’ defense to make it consistent with efficiency analyses” (emphasis added). Kwoka and Warren-Boulton, at 432-433.

886. Messrs. Kwoka and Warren-Boulton propose that, when there is “proof that, without the merger, the assets owned by the acquired firm would shortly be leaving the market,” “an ‘exiting asset’ defense replace the current ‘failing firm’ and ‘failing division’ defenses” and that this defense be made available “even to leading firms in concentrated markets.” The authors also urge that an exiting asset defense not be “limited to cases when the acquired firm is ‘failing’ but be extended to include profitable firms or divisions that “could be earning even more by producing another product or by being acquired by a firm in another market.” Kwoka and Warren-Boulton, at 446-47.

887. However, recognizing “the practical difficulty of determining the efficiency and price effects of mergers” and formidable “evidentiary problems,” the authors would “insist, whenever possible, on alternatives short of merger to achieve particular efficiencies.” Kwoka and Warren-Boulton, at 432-433.

888. The evidence discussed in A. hereinabove, however, clearly shows that in the instant case “alternatives short of merger” were open to Olin and, therefore, the exiting asset defense would not be available to Olin.

889. Furthermore, the evidence in this case fails to show that FMC has made an unsuccessful effort to sell its isos business to a competitively preferable buyer or that there were no competitively preferable acquirers. [200] See Kwoka and Warren-Boulton, at 444, 448. On the contrary, the evidence shows that throughout the period from 1984 to mid-1985, when FMC perceived “a window of opportunity” to find a buyer for its isos business, FMC approached only a selected few it considered friendly or “logical” buyers, and other equally likely prospects, including PPG, Nissan, Shikoku, Dow Chemical, du Pont and Union Carbide were never approached with an offer to sell FMC’s isos assets and business. See RPF 439-443, 452-459; CPF 1488-1492, 1494-1505, 1512.

890. Evidently, the only prospective purchaser other than Olin contacted by FMC in the fall of 1984 was PPG. (Furrer, Tr. 3514-17) PPG's Richard Hughes testified that # # (Hughes, TR. 5228#) The chlor-alkali plant was reportedly operating # # (CX 405-P#) and, along with the chlorine and caustic business, was eventually excluded from the assets sold to Olin. (Answer, ¶ 12, Furrer, Tr. 3414; Kosche, Tr. 8504-09#)

891. It is fair to conclude, therefore, that even if we were to accept the novel "exiting assets" doctrine, it would not save the challenged acquisition in this case.

VIII. THE CHALLENGED ACQUISITION CONSTITUTES A VIOLATION OF
SECTION 7 OF THE CLAYTON ACT AND SECTION 5
OF THE FEDERAL TRADE COMMISSION ACT

892. From all of the foregoing, it is found and concluded that the effects of the challenged acquisition are likely to lessen competition substantially in the production and sale of (1) isocyanurates and calcium hypochlorite and (2) isocyanurates in the United States in violation of Section 7 of the Clayton Act and Section 5 of the Federal Trade Commission Act.

IX. RELIEF

893. It is axiomatic that the normal remedy in Section 7 cases is the divestiture of what was acquired unlawfully. Indeed, divestiture is the remedy specified in Section 11(b) of the amended Clayton Act. And divestiture is particularly appropriate in this case, inasmuch as the acquired isocyanurate assets were maintained in accordance with an agreement entered into by the parties. It is also well established that the Commission's panoply of remedial sanctions includes the power to bar unauthorized future acquisitions as well as other ancillary measures reasonably calculated to restore competition in the relevant market. [201] *United States v. E.I. du Pont de Nemours & Co.*, 366 U.S. 316, 330-331 (1961); *Hospital Corp. of America v. FTC*, 807 F.2d at 1393. And, there is no indication in this record that a divestiture order may bring about a loss of substantial efficiencies or other important benefits to the consumer. Therefore, respondent should be required to divest the acquired assets, including those related to the production of cyanuric acid. Inclusion of the cyanuric acid-related assets is necessary in order to ensure the viability of the divested assets and business and to facilitate the accomplishment of the required divestiture.

894. The administrative law judge has considered less restrictive measures, including a partial divestiture which will permit Olin to retain the acquired assets directly related to CA production. *Cf. Beneficial Corp. v. FTC*, 542 F.2d 611, 619 (3rd Cir. 1976). However, the evidence is clear that in order to insure the viability of the divested business the purchaser should be enabled to enter the market with CA production capability. Anything less will be a divestiture in name only and would thrust the purchaser-entrant into an arena dominated by vertically-integrated and long entrenched firms.

895. At the same time, the Sulfolane process technology acquired from FMC need not be included in the divestiture package inasmuch as that package will include the preferred dry pyrolysis technology. The administrative law judge is persuaded that in these circumstances a partial divestiture excluding the acquired Sulfolane technology is fully justified. [202]

X. CONCLUSIONS OF LAW

1. The Federal Trade Commission has jurisdiction over the subject matter of this proceeding and over Olin Corporation ("Olin").

2. Olin was, at all times relevant herein, a corporation engaged in commerce, as "commerce" is defined in Section 1 of the Clayton Act, as amended, 15 U.S.C. 12, and is a corporation whose business is in or affecting commerce as "commerce" is defined in Section 4 of the Federal Trade Commission Act, as amended, 15 U.S.C. 44.

3. The appropriate lines of commerce within which to evaluate the competitive effects of the acquisition of FMC Corporation's ("FMC") swimming pool chemicals assets by Olin are (a) the manufacture and sale of chlorinated isocyanurates and calcium hypochlorite dry swimming pool sanitizers and (b) the manufacture and sale of chlorinated isocyanurate dry swimming pool sanitizers.

4. The appropriate geographic market within which to evaluate the competitive effects of the acquisition of FMC's swimming pool chemicals business is the United States as a whole.

5. The effect of this acquisition has been or may be substantially to lessen competition or to tend to create a monopoly in the aforesaid product and geographic markets in violation of Section 7 of the Clayton Act, as amended, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45, in the following ways:

- (a) By eliminating FMC as a significant, independent, competitive entity in the relevant lines of commerce;
- (b) By eliminating substantial direct competition between Olin and FMC in the relevant lines of commerce;
- (c) By significantly increasing already high levels of concentration in the aforesaid lines of commerce and thereby increasing the likelihood of successful collusive behavior among the remaining firms in the relevant lines of commerce; and
- (d) By increasing the risks and barriers to entry into the aforesaid lines of commerce.

6. The order entered hereinafter is necessary and appropriate to remedy the violation of law found to exist. [203]

ORDER

For the purposes of this order, the following definitions shall apply:

1. "FMC" means the FMC Corporation swimming pool chemicals business acquired by Olin Corporation from FMC Corporation, and specified in the *Agreement to Maintain Isocyanurate Assets and to Terminate the Monsanto Tolling Agreement*, an agreement entered into by Olin Corporation and the Federal Trade Commission, dated July 18, 1985, together with all of the assets, title and properties, tangible and intangible of said business, and its associated interests, rights and privileges, including without limitation all buildings, leaseholds, machinery, equipment, raw material reserves, inventory, customer lists, copyrights, trade names, trademarks, trade secrets, patents and other property of whatever description, together with all additions and improvements thereto made subsequent to the acquisition.

2. "Commission" means the Federal Trade Commission. [204]

I.

It is ordered, That respondent Olin Corporation, a corporation, including its successors and assigns, and its officers, directors, agents, representatives, employees, subsidiaries and affiliates (hereinafter "Olin"), shall divest, subject to the prior approval of the Commission, FMC within twelve (12) months from the date this order becomes final.

II.

It is further ordered, That the divestiture required by this order shall be accomplished absolutely and in good faith and shall transfer the assets to be divested as a viable, competitive concern engaged in the manufacturing and sale of swimming pool chemicals, *provided, however,* that the Sulfolane process technology and know-how for the manufacture of cyanuric acid may be excluded from the divestiture required by this order.

III.

It is further ordered, That pending any divestiture required by this order, Olin shall not cause or permit impairment of the marketability or viability of FMC. [205]

The Federal Trade Commission may seek civil penalties and other relief available to it pursuant to § 5 (1) of the Federal Trade Commission Act, 15 U.S.C. 45 (1), or any other statute enforced by the Commission, for any failure by Olin to comply with this order and the appointment of a trustee or the failure to appoint a trustee shall not preclude the Federal Trade Commission from seeking such civil penalties or other relief.

IV.

It is further ordered, That if Olin has not divested all of the properties, assets, or enterprises required to be divested pursuant to Sections I and II of this order within the twelve-month period provided therein, the Federal Trade Commission may select a trustee to effect any ordered divestiture yet to be accomplished and bring an action pursuant to § 5 (1) of the Federal Trade Commission Act, 15 U.S.C. 45 (1), or any other statute enforced by the Commission, to appoint a trustee to effect any ordered divestiture yet to be accomplished. The trustee shall be a person with experience and expertise in acquisitions and divestitures.

Any trustee appointed by the Federal Trade Commission pursuant to this Section shall have the following powers, authority, duties, and responsibilities: [206]

A. The trustee shall have the exclusive power and authority to divest any properties required to be divested pursuant to Section I of

this order that have not been divested by Olin within the time period for the divestiture provided therein. The trustee shall have eighteen (18) months from the date of appointment to accomplish the divestiture, which shall be subject to the prior approval of the Federal Trade Commission. If, however, at the end of the eighteen-month period the trustee has submitted a plan of divestiture or believes that divestiture can be achieved within a reasonable time, the divestiture period may be extended by the Federal Trade Commission or by the court for a court-appointed trustee. Any delays in divestiture caused by Olin, shall extend the time for divestiture in accordance with the delay caused.

B. The trustee shall have full and complete access to the personnel, books, records and [207] facilities of any of the properties that the trustee has the duty to divest, and Olin shall develop such financial or other information relevant to the properties to be divested as such trustee may reasonably request. Olin shall cooperate with the trustee, and shall take no action to interfere with or impede the trustee's accomplishment of the divestiture.

C. The power and authority of the trustee to divest shall be at the most favorable price and terms available consistent with this order's absolute and unconditional obligation to divest, and the purposes of the divestiture as stated in Section I of this order.

D. The trustee shall serve, without bond or other security, at the cost and expense of Olin on such reasonable and customary terms and conditions as the Federal Trade Commission or a court may set. The trustee shall have authority to retain, at the cost and expense of Olin, such consultants, [208] attorneys, investment bankers, business brokers, accountants, appraisers, and other representatives and assistants as are reasonably necessary to assist in the divestiture. The trustee shall account for all monies derived from the sale and all expenses incurred. After approval by the Federal Trade Commission of the account of the trustee, including fees for his or her services, all remaining monies shall be paid to Olin and the trustee's power shall be terminated. The trustee's compensation shall be based at least in significant part on a commission arrangement contingent on the trustee divesting the trust property.

E. Within twenty (20) days after the appointment of the trustee, Olin shall transfer to the trustee all rights and powers necessary to divest any of the properties and to sign any of the agreements required by Section I of the order.

F. Olin shall indemnify the trustee and hold the trustee harmless against any losses, [209] claims, damages, or liabilities to which the trustee may become subject, arising in any manner out of, or in connection with, the trustee's duties under this order, unless the Federal Trade Commission determines that such losses, claims, damages, or liabilities arose out of the misfeasance, gross negligence, or the willful or wanton acts or bad faith of the trustee.

G. If the trustee ceases to act or fails to act diligently, a substitute trustee shall be appointed.

H. The trustee may ask the Federal Trade Commission or the court for a court-appointed trustee to issue, and the Federal Trade Commission or the court may issue, such additional orders or directions as may be necessary and appropriate to accomplish the divestitures required under this order.

I. The trustee shall have no obligation or authority to operate or maintain any of the properties, assets, or enterprises required [210] to be divested pursuant to Section I of this order.

J. The trustee shall report in writing to Olin and the Federal Trade Commission every sixty (60) days concerning the trustee's efforts to accomplish divestiture.

V.

It is further ordered, That for a period of ten (10) years from the date this order becomes final, Olin shall cease and desist from acquiring, directly or indirectly, through subsidiaries or otherwise, without the prior approval of the Commission, the whole or any part of the stock, share capital, or assets of, or any interest in, any concern, corporate or noncorporate, engaging in the manufacturing and sale of swimming pool chemicals, including entering into any agreement, understanding or arrangement with any such concern by which Olin would obtain the market share, in whole or in part, of such concern in the manufacturing and sale of swimming pool chemicals. [211]

VI.

It is further ordered, That within sixty (60) days from the date this order becomes final, and every sixty (60) days thereafter, until it has fully complied with Section I of this order, Olin shall submit a verified report in writing to the Commission setting forth in detail the manner

and form in which it intends to comply, is complying or has complied therewith. All such reports shall include, in addition to such other information and documentation as may hereafter be requested (a) a specification of the steps taken by Olin to make public its desire to divest the FMC swimming pool chemicals assets; (b) a list of all persons or organizations to whom notice of divestiture has been given; (c) a summary of all discussions and negotiations together with the identity and address of all interested persons or organizations; and (d) copies of all reports, internal memoranda, offers, counteroffers, communications and correspondence concerning said divestiture.

VII.

It is further ordered, That respondent Olin shall notify the Commission at least thirty (30) days prior to any proposed changes in the corporate respondents which may affect compliance obligations arising out of the order, such as dissolution, [212] assignment or sale resulting in the emergence of successor corporations, or the creation or dissolution of subsidiaries.

OPINION OF THE COMMISSION

BY AZCUENAGA, *Commissioner*:

I. INTRODUCTION

Olin Corporation, the leading domestic producer of dry swimming pool sanitizers, acquired FMC Corporation's swimming pool chemical business. Finding that the merger was likely to produce a substantial lessening of competition in the relevant markets in violation of Section 7 of the Clayton Act and Section 5 of the Federal Trade Commission Act, the Administrative Law Judge ordered divestiture. We affirm.

A. *Background*

On February 7, 1985, Olin Corporation ("Olin") signed a letter of intent to acquire the assets that constituted the swimming pool chemical business of FMC Corporation ("FMC"). The price was \$49.5 million, subject to inventory and other adjustments. The assets included FMC's production facility for swimming pool sanitizers at South Charleston, West Virginia, a repacking plant at Livonia, Michigan, the brand names used by FMC, the technology for the

production of cyanuric acid and a fifty percent interest in a British affiliate.

On July 18, 1985, the Federal Trade Commission issued a complaint challenging the transaction, and on July 20, 1985, Olin and the Commission entered an asset maintenance agreement. Under that agreement, Olin is required to maintain and manage the acquired assets to preserve the Commission's ability to order divestiture if that should prove to be appropriate at the end of the administrative proceeding, and the Commission agreed not to seek a federal court injunction against consummation of the transaction pending the outcome of the administrative proceeding. The acquisition was consummated on August 16, 1985.

The acquiring firm, Olin, is a diversified Virginia corporation that manufactures and markets chemicals, including the swimming pool sanitizers calcium hypochlorite and isocyanurates. Olin has produced calcium hypochlorite ("cal hypo") since 1928 and currently operates the world's largest cal [2] hypo plant at Charleston, Tennessee. ID ¶¶ 9, 10.¹ In the 1977-1980 period, Olin constructed plants to produce cyanuric acid, an intermediate chemical in the production of isocyanurates ("isos"), and to produce two forms of isos, sodium dichloroisocyanurate ("dichlor") and trichloroisocyanuric acid ("trichlor"). Because of production problems, Olin closed its cyanuric acid plant in 1980 but continued to produce isos at the Lake Charles, Louisiana plant with cyanuric acid purchased from other manufacturers, including Nissan in Japan. ID ¶¶ 15, 492. In August 1984, Olin discontinued production of isos and began to market isos purchased from Monsanto under a toll production agreement. During the period when it purchased isos from Monsanto, Olin maintained its Lake Charles facility in readiness to resume production of isos. ID ¶¶ 16, 17.

FMC is a diversified manufacturer that, until this transaction, produced cyanuric acid and isos at its South Charleston, West Virginia

¹ The following abbreviations are references to the record:

ID	—	Initial Decision
RB	—	Respondent's Appeal Brief
CB	—	Complaint Counsel's Answering Brief
RRB	—	Respondent's Reply Brief
CX	—	Complaint Counsel's Exhibit
RX	—	Respondent's Exhibit
Tr.	—	Hearing Transcript.

plant. ID ¶¶ 39. FMC and Olin are not the only suppliers of these sanitizers in the United States. Monsanto produces cyanuric acid and isos in the United States, and dry sanitizers are imported, primarily from Japan. In addition to Olin, PPG Industries produces cal hypo. ID ¶¶ 153, 157-58, 335.

B. The Complaint and Initial Decision

The complaint alleged that the acquisition, if consummated, would violate Section 7 of the Clayton Act, 15 U.S.C. 18, and Section 5 of the FTC Act, 15 U.S.C. 45, and that the purchase agreement violated Section 5 of the FTC Act, 15 U.S.C. 45. The complaint alleged a substantial lessening of competition in two product markets: the “manufacture and sale of chlorinated isocyanurate and calcium hypochlorite dry swimming pool sanitizers” and the “manufacture and sale of chlorinated isocyanurate dry swimming pool sanitizers.” The Administrative Law Judge (“ALJ”) supervised extensive discovery and conducted an administrative hearing that accumulated a transcript of 9945 pages.

Administrative Law Judge Hyun found two relevant product markets in which to assess the competitive effects of the [3] transaction. First, he concluded that dry swimming pool sanitizers, isocyanurates and cal hypo together, constitute a relevant market. ID ¶¶ 181-274. This conclusion was based on the characteristics and uses of the two chemicals, their price elasticity, trade recognition of the price relationship between the two chemicals, and the perceptions of buyers and sellers. *Id.* The ALJ concluded that liquid chlorine bleach for pool use was not part of the dry sanitizer market. ID ¶¶ 285-314.

Second, the ALJ decided that isocyanurates alone constitute a relevant product market. *ID ¶¶ 275-84. Both parties agree.

The ALJ determined that the United States is the relevant geographic market. ID ¶¶ 321-54. Although both cal hypo and isos have been imported in significant quantities, the ALJ concluded that the world is not the relevant market. Antidumping duty orders have been imposed with respect to both cal hypo and isos. ID ¶¶ 343-51. Capacity constraints and fluctuations in currency exchange rates also have contributed to the absence of a world market in these products. ID ¶¶ 632-48.

The ALJ found that the markets for dry pool sanitizers and isocyanurates are highly concentrated, that the merger would significantly increase that concentration and that the merger would

eliminate substantial direct competition between the two firms. Judge Hyun found that imports of cal hypo or isos cannot be relied on to ensure competition in the United States markets. The ALJ also found that the acquisition would have anticompetitive effects in the market for isos and dry pool sanitizers. Although Olin had encountered difficulties in producing cyanuric acid and had entered a tolling agreement with Monsanto to process isos, the ALJ decided that it remained a viable isos producer. ID ¶¶ 650-709. Finally, the ALJ concluded that the evidence failed to establish an “exiting assets” defense even assuming that such a defense existed. ID ¶¶ 884-91.

Judge Hyun ordered Olin to divest the entire FMC swimming pool chemical business. ID ¶ 893. He rejected an argument that Olin should be permitted to retain the portion of the plant dedicated to the production of cyanuric acid.²

C. Questions Presented on Appeal

Olin appeals from the Administrative Law Judge’s decision and order and raises seven issues. First, Olin argues that Judge Hyun incorrectly determined that isos and cal hypo are part of the dry sanitizer product market, asserting that they are separate and distinct products. Alternatively, Olin asserts that [4] if the market is broader than isos only, it should include liquid chlorine bleach for pool use. Second, Olin argues that at the time of the acquisition, it was not a viable producer of isos and could not become one absent the acquisition. Third, Olin argues that the ALJ overstated FMC’s preacquisition market position. Fourth, Olin asserts that the conclusion that the acquisition substantially lessened competition is not supported by substantial evidence. Fifth, Olin argues that Judge Hyun erred in rejecting what it calls the “exiting assets” defense. Sixth, Olin claims that the ALJ erred in excluding certain testimony by Olin’s economic expert witness. Seventh, Olin claims that the divestiture order is overly broad and is punitive because it requires the divestiture of the portion of the plant dedicated to producing cyanuric acid. We take up each of these issues below.

II. PRODUCT AND GEOGRAPHIC MARKETS

A. Introduction

Section 7 of the Clayton Act prohibits acquisitions “where in any

² We adopt the findings of fact in the Initial Decision to the extent that they are not inconsistent with this opinion.

line of commerce or in any activity affecting commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly." 15 U.S.C. 18. The first step in evaluating the competitive consequences of a merger is to ascertain the relevant product and geographic markets.³

At one time, merger analysis was based on rigid categorization of the relevant product or products and the pertinent geographic area, and all further consideration was based on transactions in that market. That approach tended to make market classifications all-or-nothing decisions and failed to account for the possibility of a continuum of competitive relationships among products and geographic areas.

We no longer use such rigid analysis but incorporate in the decision-making process the economic concept of cross-elasticity of demand, which measures the sensitivity of the demand for one product to a small change in the price of a second product. The Commission has observed that if cross-elasticities can be estimated with reasonable accuracy, the precise limits of the product market become less critical to the analysis. *Grand Union Co.*, 102 FTC 812, 1040 (1983).

Citing *Grand Union*, Olin argues that affirmative proof of cross-elasticity of demand between isos and cal hypo is essential to define a product market that includes both chemicals. RB [5] at 10. Olin argues that the ALJ's reasoning "insults the integrity of antitrust market analysis." RB at 10.⁴ The identification of a product market, however, does not necessarily hinge on numerical calculation and proof of demand elasticity, the search for which is often fruitless because of the difficulty of measuring elasticities. The Supreme Court held that product markets are defined either by "the reasonable interchangeability of use or the cross-elasticity of demand. . . ." *Brown Shoe Co. v. United States*, 370 U.S. 294, 325 (1962). In *Grand Union*, the Commission observed that a product market may be defined either in terms of the "cross-elasticity of demand" or the "reasonable interchangeability of use" between the product in question and potential substitutes. 102 FTC at 1041-42. Indeed, the Commission had little information about elasticities in that case and applied its judgment on the basis of circumstantial factors. *Id.* at

³ See, e.g., *United States v. Marine Bancorporation, Inc.*, 418 U.S. 602, 618 (1974), quoting *United States v. Du Pont & Co.*, 353 U.S. 586, 593 (1957).

⁴ Olin argues that the record "unequivocally demonstrates" the absence of cross elasticity of demand between isos and cal hypo and relies on findings 192-194 in support of this claim. RB at 9. The evidence in the record, dismissed below in section IB, includes statements by Olin itself acknowledging a price relationship between isos and cal hypo.

1041. Of course, when reliable information concerning cross-elasticity of demand is available, it can be “most important” in product market definition. *Beatrice Foods Co.*, 101 FTC 733, 801 (1983).

The Commission’s approach permits and encourages, but does not require, direct numerical calculation and proof of cross-elasticity of demand and is consistent with the *Statement of Federal Trade Commission Concerning Horizontal Mergers* 12 (1982) (hereafter “*FTC Merger Statement*”) and with the Department of Justice’s *Merger Guidelines*, 49 Fed. Reg. 26,824 (1984) (hereafter “*Justice Merger Guidelines*”). The *FTC Merger Statement* recognizes that direct cross-elasticity data are “generally unavailable” and that product markets may be defined by less direct evidence. The *Justice Merger Guidelines* indicate that if a small but significant and nontransitory price increase would cause so many buyers to shift from a product to an alternative product that the price increase would not be profitable, then the alternative is included in the product market. *Justice Merger Guidelines* at § 2.11. The *Justice Merger Guidelines* recognize that direct evidence of the consequences of an hypothesized future price increase will rarely be available and suggest that all relevant evidence be considered. *Id.* at § 2.12. Such evidence may include the perceptions of buyers that the products are or are not substitutes, certain differences in price movements that are not explained by parallel trends, similarities or differences in use, design, physical composition and technical characteristics, and the perceptions of sellers that the products are substitutes. *Id.* We adhere to the [6] approach of considering all reliable evidence relevant to the question whether consumers would turn to an alternative product if faced with a small but significant and nontransitory price increase.

B. Product Markets

Olin argues that the product market should be defined to include only isos and not cal hypo. Olin also argues that it was not and would not become a viable isos producer, and consequently that the merger did not have a substantial adverse effect on competition.

Swimming pool sanitizers kill algae and bacteria. ID ¶65. Chlorine is the active sanitizing ingredient in isos, cal hypo and liquid bleach.⁵ *Id.* Chemical treatment of swimming pools requires the addition of

⁵ Some other chemicals, such as lithium hypochlorite and bromine compounds, can be used as swimming pool sanitizers. ID ¶¶ 315-17. These chemicals are used in only insignificant quantities and do not act as a constraint on the pricing of the chlorine based chemicals, cal hypo and isos. *Id.* Even the respondent’s expert dismissed the other chemicals as unimportant. Tr. 9136.

enough sanitizers to kill the algae and bacteria, and the addition, as appropriate, of chemicals to adjust the water's acidity or stabilize the chlorine in the pool water. ID ¶¶ 65-71. The major consumption of pool sanitizers is in maintaining the chlorine level in the pool water at 1 to 3 parts per million ("ppm"), as recommended by the Environmental Protection Agency. ID ¶¶ 65-68. Intermittently, pools are "shocked" by the addition of enough chlorine to raise the level to 5-20 ppm. ID ¶ 67. Shock treatments eliminate any bacteria and algae that have escaped the routine maintenance treatments.

The two forms of isocyanurates for pool sanitation are dichlor and trichlor. ID ¶ 79. Dichlor has a chlorine content of 56-62%, and trichlor has a chlorine content of 90%. *Id.* Both are white crystalline solids and are used principally for pool sanitation. Dichlor dissolves rapidly, must be reapplied frequently, and is generally used in a granular form that is broadcast into the pool. ID ¶ 88. Trichlor dissolves more slowly and is often applied in the form of tablets or sticks that dissolve slowly. ID ¶ 86. Trichlor is quite acidic, but dichlor is not.

Calcium hypochlorite is also a white crystalline solid, has either 65% or 70% chlorine content and is also sold for pool sanitation. ID ¶¶ 92-93. Cal hypo is sold in both a granular form and a relatively new tablet form. ID ¶¶ 95, 181. [7]

Similarities in the usage, physical composition, and technical characteristics of cal hypo and isos predominate over the minor differences between the two chemicals. The chlorine content of cal hypo is within the range of the chlorine content of the two forms of isos. Both cal hypo and isos are relatively stable chemicals, and a pool owner can purchase a year's supply of either in a single trip to the store. ID ¶ 186. Both cal hypo and isos are available in granular and stick or tablet form.

Isos appear to be somewhat more convenient to use than cal hypo. Cyanuric acid must occasionally be added to a pool treated with cal hypo to act as a stabilizer, and isos last longer than cal hypo. ID ¶ 270. The convenience of isos is reflected in a price premium that isos maintain over cal hypo. ID ¶ 269. In light of the obvious similarities in form, usage and function, it seems apparent that cal hypo and isos are effective substitutes for one another.

Circumstantial evidence regarding the price relationship between isos and cal hypo supports the conclusion that the two products are in one product market. Strong evidence comes from the antidumping

case in which Olin sought the imposition of duties on imports of cal hypo from Japan. Olin filed with the International Trade Commission (“ITC”) a “Pre-Hearing Statement of Olin Corporation” on February 26, 1985, stating:

We recognize that the domestic calcium hypochlorite industry faces increased competition from other pool chemical products, particularly from isocyanurates. Isocyanurates, however, traditionally have been priced substantially above calcium hypochlorite products. As the price of isocyanurates dropped in recent years, in large part due to Japanese dumping of that product, some consumers have chosen to purchase that product instead of either domestic or foreign-made calcium hypochlorite. CX 386I

In the same antidumping proceeding, Olin advised the ITC, “Olin recognizes that calcium hypochlorite must compete in the market with other chemical products, such as chlorinated isocyanurates. . . .” Conference Brief of Petitioner Olin Corporation, CX 380L. *See also* CX 383E. Olin’s statement to the ITC persuasively illustrates its belief that as the price premium for isos narrowed, customers switched from cal hypo to isos.

Internal Olin planning documents confirm the price relationship between the two chemicals. Olin’s “1983 Pool Chemicals CEO Presentation” stated that “Isocyanurates have sharply increased their share of [the chemical] ‘used most often’ since 1979, with calcium hypochlorite shouldering the loss.” RX 52K. The Olin document also stated: “*A dramatic narrowing of the price differential between HTH [an Olin brand of cal hypo] [8] and isocyanurates has taken place, correlating very strongly with the change previously noted in the share relationship.*” RX 52N (emphasis in original). Other Olin documents record the narrowing of the price premium of isos over cal hypo and the simultaneous market share gains by isos. ID ¶¶ 198-200. Olin’s representations to the International Trade Commission and the statements in its internal documents about the relationship between isos and cal hypo provide important evidence that the two dry sanitizers are in the same antitrust product market.⁶ We do not rely on the International Trade Commission’s determinations relating to the scope of a domestic industry, which may involve a legal standard different from those we apply in antitrust, but we do rely on Olin’s

⁶ Olin did not suggest to the International Trade Commission that the price movements might be due to coincidental, but extrinsic, circumstances, such as changes in the costs of production of the two chemicals. Had Olin been aware of any such circumstances, presumably it would not have made the statements suggesting that the prices of isos and cal hypo were related.

factual statements indicating a significant degree of cross-elasticity between the products.

Olin is not alone in making this important observation. PPG, the second largest producer of cal hypo, similarly observed that "[c]onsumption of calcium hypochlorite as a swimming pool sanitizer can be affected by chlorinated isocyanurate consumption." CX 548D; see ID ¶¶ 212-13. Internal documents from FMC, a producer of isocyanurates, recognize that there is an equilibrium price differential between isos and cal hypo at which sales of the two chemicals grow at the same rate. ID ¶¶ 214-17. Other producers and sellers have made similar observations. ID ¶¶ 218-23.⁷

Olin argues that the Administrative Law Judge found that sellers make their isos pricing decisions based "exclusively" on the price of competing brands of isos, not cal hypo. RB at 11. Olin overstates the point. The Judge found that due to the price disparity between the two chemicals, their pricing is set "primarily" on the bases of costs and competition with the same chemical. Id. ¶ 192.⁸ Sellers' initial and primary reference to [9] the prices of the same chemical is not surprising where, as here, the greater convenience of isos over cal hypo supports a price premium. This seems particularly true if the two chemicals have reached an equilibrium price at which consumers are not switching, as a PPG witness believes has been the case since 1984. Tr. 5347-48. Evidence of what has happened during a period of equilibrium, in which convenience supports a stable customer base despite a price premium, does not serve as a predictor of what would happen if the price of isos or cal hypo rose above the competitive level.

The parties stipulated and, in a finding that we adopt, the administrative law judge concluded that isos is a relevant product market. That necessarily means that buyers, when faced with a small but significant and nontransitory price increase, would not shift to cal hypo in sufficient numbers to make the price increase unprofitable. Finding a product market in isos is consistent with the evidence that

⁷ Olin and other producers not only observed the price relationship between isos and cal hypo, but also have made business decisions on the basis of this competitive relationship. ID ¶¶ 205-10.

⁸ Some retailers and repackers testified that they looked only to the prices of the same chemical, Tr. 1698-99, but others recognized that competing chemicals played a secondary part in pricing a particular chemical. For example, Mr. Marshall, a repacker witness, testified that the "main consideration" in setting the price of a chemical is the competition for that specific product, but that the prices of the alternative (cal hypo or isos, as the case may be) "are certainly considered." Tr. 1200.

Mr. Hughes, a PPG executive, testified that in setting the price of cal hypo, PPG generally does not consider the price of isos. Tr. 9195. He also testified, however, that in 1984, PPG believed that isos dealers would not be able to pass on a price increase to their customers because of competition with cal hypo. Tr. 5262-64. He further stated that isos and cal hypo "do compete with each other in the marketplace." Tr. 5331.

the demand for isos is inelastic, that distributors of isos believe the price of isos could go up more than five percent without consumers switching to cal hypo, and that sellers of isos make pricing decisions based on the price of competing brands of isos. ID ¶¶ 192-194.

We also agree with the administrative law judge that cal hypo and isos together constitute a relevant market of dry pool sanitizers. These two product market findings are consistent. Market definition depends on the relative prices of products and the impact that changes in those relative prices have on consumer behavior.⁹ [10]

Before the acquisition of FMC, Olin dominated the domestic production of cal hypo. Its share of United States production of cal hypo ranged between 79% and 89% in the period from 1980 through 1984. ID ¶¶ 388, 465. The other domestic producer, PPG, was a price follower. ID ¶ 392. Some product was imported from Japan, but the antidumping action, filed in April 1984, caused a reduction in the quantity of cal hypo supplied by the Japanese firms. ID ¶¶ 626-28. Although the market structure suggests the possibility of market power in cal hypo, the price of cal hypo remained below the price of isos. During the period from 1977 to 1983, the price premium of isos over cal hypo had decreased because the price of cal hypo increased at a faster rate than that of isos. ID ¶¶ 197-98. After the price spread between cal hypo and isos narrowed, Olin could not profitably impose a small but significant and nontransitory increase in the price of cal hypo because of the danger that consumers would then switch to isos.¹⁰ ID ¶¶ 209-10.

Nevertheless, a firm with market power over both cal hypo and isos could profitably impose a small but significant and nontransitory increase in the price of both chemicals. As discussed above, consumers, when faced with similar price increases in both products, would not shift to other products, such as pool bleach, in sufficient numbers to make the price increase unprofitable. Therefore, one relevant market in which to evaluate the competitive effect of the acquisition of FMC includes both cal hypo and isos.

The relevant market in which to evaluate the competitive position of

⁹ Consumer preferences vary along a continuum and are not easily placed in all or nothing categories, but in this case, the evidence suggests enough of a consumer preference for isos that isos is a relevant product market. The evidence also suggests that the consumer preference for cal hypo was weak enough that as the price of cal hypo approached the price of isos, a small additional price increase would cause large numbers of consumers to shift from cal hypo to isos.

¹⁰ Isos had advantages over cal hypo for consumers. If the prices of isos and cal hypo were the same, most, if not all, consumers would choose to use isos. To maintain its cal hypo business, Olin was constrained to keep the price below that of isos.

Olin, as a producer of cal hypo, is the dry sanitizer market including both cal hypo and isos. The relevant market in which to evaluate the competitive position of Olin as a producer of isos includes both the market for isos and the larger market for dry pool sanitizers. It is appropriate then to consider the impact of the merger on competition both in the market for isos and in the combined market for isos and cal hypo. [11]

C. Exclusion of Expert Testimony

The respondent's argument that isos and cal hypo are not in the same product market rests heavily on testimony proffered by its economic expert that the ALJ excluded from evidence. Olin argues that the testimony should have been admitted, and that, if admitted, the testimony would establish that cal hypo prices do not influence isos prices. Judge Hyun excluded the testimony on the ground that Olin failed to provide complaint counsel with timely notice and an adequate opportunity to prepare for cross-examination. ID ¶ 204; Tr. 9078-84. The Judge also said that the basis for the expert's opinion was not, as provided in Rule 703 of the Federal Rules of Evidence, "of a type reasonably relied upon by experts in the particular field." ID ¶ 204.

First, we consider whether the Administrative Law Judge properly excluded the testimony on the ground that the respondent failed to give adequate notice to complaint counsel. Olin notified complaint counsel on April 16, 1987, that it proposed to use six documents (RX 386-91) during direct examination of its expert, who testified five days later. On April 17th, complaint counsel moved to preclude the use of these exhibits at trial.¹¹ Complaint counsel objected that this last minute notification violated paragraph 2(c) of the Prehearing Order of September 17, 1985, which provided that the proponent of tables, graphs, or charts summarizing statistical data "shall serve copies of them sufficiently in advance of the commencement of trial and shall at the same time advise opposing counsel where the underlying data may be examined. . . ." At the trial on April 21, 1987, the respondent's

¹¹ Complaint Counsel's Motion to Preclude, Dkt. No. 9196 at 2824 (April 17, 1987). Respondent points out that it sent complaint counsel a copy of statistical material on March 26, 1987, and a copy of six documents later offered as exhibits on April 3, 1987. *Id.* at App. A. Respondent's "Memorandum in Support of Motion for Reconsideration of Order Excluding Certain Testimony of Respondent's Expert Witness," May 15, 1987. The statistical material was disclosed one day after the conclusion of the expert's second deposition, and the disclosure of the graphs on April 3rd neither indicated that they would be used at trial for any purpose nor that they were based on the March 26 statistical material.

expert proffered testimony about his inferences from and analyses of the six charts and graphs.

Section 3.38(b) of the Commission's Rules provides that if a party fails to comply with a prehearing order of an Administrative Law Judge requiring advance notice of exhibits, the ALJ or the Commission may, among other things, "[r]ule that the party may not introduce into evidence . . . the documents" in question. 16 CFR 3.38(b)(3). We believe that [12] Judge Hyun did not abuse his discretion in excluding the testimony under the circumstances here. After lengthy discovery and well into the presentation of the case in defense, the respondent turned the graphs over only days before the expert was to take the stand.¹² As the official responsible for supervising discovery, Judge Hyun was particularly well situated to discern whether Olin's timing was consistent with his order. We affirm the decision of the ALJ that Olin failed to comply with the prehearing order.

Our inability to test the reliability of the data that Olin's economic expert intended to use in reaching his conclusions underscores the importance of complying with pretrial orders to provide an opportunity for adequate cross-examination.¹³ The Olin economic expert relied on a statistical compilation prepared by an Olin employee at the expert's request specifically for the purposes of the trial. Olin makes no argument that this compilation was an ordinary business document under an exception to the hearsay rule, and, on the basis of the record, we have no way to evaluate the reliability of the compilation.

The statistics on which the excluded testimony of Olin's expert relied allegedly showed that "when dumping margins were imposed on isos in 1984, isos prices rose substantially, while cal hypo prices and volumes remained stable." RB at 9 n.5. The respondent's proposed findings rely on the excluded testimony for these factual conclusions. RPF 700-04; RB at 9 n.5. These allegations were to have provided a factual basis for the proffered opinion of Olin's expert that the products were in separate markets. [13]

¹² The respondent argued that it could not have turned the material over more quickly because its expert merely extended some statistical data introduced by complaint counsel's expert in February 1987. Tr. 9803. In fact, however, respondent's expert caused an Olin employee to prepare, for this litigation, a similar set of data covering a longer time period. Tr. 9160-65. Olin made no effort to introduce the underlying statistical data in evidence.

¹³ We also agree with the Judge, in reference to Rule 703 of the Federal Rules of Evidence, that the data were not "of a type reasonably relied upon by experts in the particular field." The proposed testimony highlights a dilemma presented by expert testimony grounded on "facts" that are not introduced in evidence. See *Soden v. Freightliner Corp.*, 714 F.2d 498, 502-505 (5th Cir. 1983) (excluding expert testimony based on statistics prepared in anticipation of litigation).

The danger of reliance on “facts” prepared by one of the respondent’s employees for use at trial is highlighted by other record evidence contradicting these factual hypotheses on which Olin’s expert would have based his opinion. The confidential response to the ITC questionnaire that Olin submitted to the International Trade Commission on February 19, 1985, which was introduced in evidence as CX 384, refutes Olin’s argument that when the price of isos rose in 1984, the price of cal hypos remained stable. That questionnaire response contained Olin pricing data indicating that in 1984, prices for cal hypo products rose in many cases. CX 384V, X, Z28, Z29. Indeed, the report of the staff of the International Trade Commission in connection with its antidumping investigation indicated that cal hypo prices rose significantly in 1984. CX 176Z15, Z17. The offer of proof for the excluded testimony showed no effort to reconcile the inconsistency between the information on which the expert relied and these other facts in the record. We conclude that complaint counsel would have been prejudiced by allowing such testimony following Olin’s failure to comply with the pretrial order.

Finally, we note that the expert testimony, if admitted in evidence and found reliable, would not alter our conclusion that dry sanitizers constitute a relevant product market that includes both isos and cal hypo. The point of the expert economic testimony proffered by Olin is that when the price of isos rose following the 1984 antidumping action in isos, the expert could find little or no impact on the price and quantity of cal hypo sold. Assuming this as a fact does not impeach the dry pool sanitizer market definition we have adopted.

The parties stipulated that isos was a relevant product market. By definition that means that if the price of isos rose a small but significant and nontransitory amount, consumers would not switch to the less convenient, albeit lower priced, cal hypo in sufficient numbers to defeat the price increase. In deciding whether cal hypo and isos are in the same dry pool sanitizer market, however, the relevant question is whether if the price of cal hypo rose, thereby narrowing or eliminating the price gap between cal hypo and isos, consumers would switch to isos. Olin’s planning documents recognize that such consumer switching would take place.¹⁴ Olin’s economic expert did not propose to address that issue. **[14]**

¹⁴ One would expect that if the price of isos rose, Olin would take advantage of that price increase to later increase the price of cal hypo. The evidence suggests that Olin priced cal hypo at a level below that of isos but not high enough to induce consumers to switch to isos. ID ¶ 209-10.

D. Liquid Chlorine Bleach

Olin argues in the alternative that if the relevant market is not limited to isos, it is an all sanitizer market, including liquid chlorine pool bleach (sodium hypochlorite). Liquid pool bleach has a chlorine content of 10-12%, which is about twice the chlorine content of household laundry bleach. ID ¶¶ 112, 117. Pool bleach cannot be produced on the equipment used to produce household bleach. ID ¶ 117. Because of its low value and relatively high transportation cost, pool bleach is generally sold within 200-300 miles of the bleach plant. ID ¶¶ 119, 285. Most pool bleach is consumed in discrete geographic regions, notably southern California, parts of Florida, and the Detroit and Chicago areas. ID ¶¶ 119, 285.

The physical and technical characteristics of liquid pool bleach differ from those of the dry pool sanitizers. Compared with dry sanitizers, liquid pool bleach has a low concentration of chlorine. Although a consumer can purchase a season's worth of dry sanitizer at one time, he or she must repurchase liquid bleach frequently because it has a short shelf life. ID ¶ 296. It is generally sold in flats of four one-gallon bottles or in larger carboys (two and one-half or five gallon containers). ID ¶ 118. Additionally, spills or splashes of bleach can damage clothing or the interiors of vehicles. Consumers regard liquid bleach as an inconvenient product, compared with isos or cal hypo, and convenience is an important factor in the consumer's choice of a pool sanitizer. ID ¶¶ 299-302. Pool bleach is less expensive than either isos or cal hypo. ID ¶ 115.

Pool service companies, rather than homeowners, are the primary consumers of pool bleach. The use of pool cleaning services is most prevalent in southern California, Florida and the Detroit area, which areas coincide with the regions of heavy pool bleach consumption. ID ¶¶ 146-47. An Olin marketing document estimated that 73 percent of all bleach in southern California was consumed by pool service operators. ID ¶ 149. We conclude that if prices of cal hypo and isos rose, pool owners would not sign up for pool services using bleach in sufficient numbers to defeat the price rise.

Although the record does not contain detailed data on the cross-elasticity between isos or cal hypo and liquid pool bleach, circumstantial evidence indicates a low degree of substitution between dry and liquid sanitizers. Over the years, bleach's share of sales has remained quite stable, even during periods of intense price or convenience competition between cal hypo and isos, and when those products'

shares of sales changed significantly. ID ¶310. We conclude that liquid pool bleach is not in the relevant market composed of cal hypo and isos. [15]

E. Geographic Market

We agree with ALJ Hyun that the relevant geographic market is the United States. ID ¶354. Olin does not challenge the geographic market definition but does argue that after the acquisition, imports will ensure competition in the United States. RB at 41-44. That issue is discussed below in Section IV.

III. OLIN'S AND FMC'S PREACQUISITION MARKET POSITION

Olin claims that it was not a viable producer of isos before the FMC acquisition. Olin asserts that the ALJ incorrectly included its trichlor (isos) production capacity in assessing its preacquisition market position, arguing that it was never a viable isos producer and could not have become one. The relevant market is dry sanitizers, rather than just isos, and Olin was the number one producer in capacity and output in the market for dry sanitizers solely on the basis of its cal hypo production. ID ¶569. Nonetheless, because Olin's lead in dry sanitizers over the second largest domestic producer would be diminished if its isos capacity and output were excluded from the analysis of the market shares, the viability of Olin's isos business is significant in assessing its preacquisition market position.

Olin argues that under *United States v. General Dynamics Corp.*, 415 U.S. 486, 498 (1974), its own and FMC's preacquisition market shares are not indicative of their market power. RB at 17. Consistent with the *FTC Merger Statement*, Section III, and the *Justice Merger Guidelines*, Judge Hyun did not treat the market shares as conclusive indicators of market strength and position. ID ¶¶649, 651. Indeed, he reviewed Olin's claims of diminished competitive vitality at considerable length. ID ¶¶650-709. Olin's quarrel with the Initial Decision apparently is not over the principle that the Commission should look beyond the bare market share statistics, but rather is with the Judge's assessment of its own and FMC's competitive significance.

A. Olin's Preacquisition Position in Isocyanurates

Olin originally planned its Lake Charles, Louisiana plant as a four-part facility, including a cyanuric acid plant, a trichlor plant, a dichlor plant, and a packaging plant. ID ¶358. Olin planned that trichlor

would be the primary end product, and the dichlor plant was small and not critical to the plant's success. ID ¶¶ 359-60. Olin top management approved the construction of the four-part facility in 1977. RPF 154. After encountering significant technical difficulties with the cyanuric acid plant, Olin top management decided to shut down the cyanuric acid facility in October 1980. RPF 156-63. In 1981, Olin wrote off the cyanuric acid facility against earnings. RPF 165. [16]

Olin also experienced some difficulties with the dichlor plant during its start up phase, but the plant became operable and, in the view of the Chief Executive Officer of Olin, achieved its design capabilities. ID ¶ 369. The dichlor plant was shut down in 1982 after Olin concluded an agreement to swap its trichlor for FMC dichlor. ID ¶ 370. The Lake Charles packaging plant for isos was a failure. Although Olin operated the plant for several years after its construction in 1979, its automated systems were plagued with problems, and Olin shut down the facility permanently in 1982. ID ¶ 368; RPF at 175-77.

Olin continued to operate its trichlor production facility, despite the failure of its cyanuric acid plant. Beginning in 1980, it purchased cyanuric acid from Nissan, a Japanese producer of both cyanuric acid and isos. Olin purchased increasingly large quantities of cyanuric acid from Nissan in each year through 1984. ID ¶ 661. During the same 1980 to 1984 time period, Nissan substantially increased its capacity to produce cyanuric acid. ID ¶ 662. Olin's internal documents indicate that the company believed that Nissan had sufficient excess cyanuric acid capacity to satisfy Olin's entire demand for cyanuric acid. ID ¶ 665. In 1982 and 1983, Olin did not purchase as much cyanuric acid from Nissan as it had agreed to purchase in its annual supply contracts. ID ¶¶ 668-669. In 1984, Nissan had available enough cyanuric acid to supply Olin's requirements, and an Olin executive believed that it would be able to satisfy Olin's requirements for the next two to three years. ID ¶ 672. During the period 1982 to 1984, Nissan unfailingly fulfilled its supply and delivery commitments to Olin. ID ¶ 673.

In 1982, Olin representatives were informed that Nissan wanted to continue to supply its cyanuric acid requirements "forever." ID ¶ 677. Nissan indicated that it could undertake two debottlenecking steps that would significantly expand its capacity and offered to make the expansions to accommodate Olin's needs. ID ¶¶ 679-80.

In 1984, however, Olin entered an agreement with Monsanto, which was to become effective July 1, 1984, and continue for at least two

and one-half years and thereafter to terminate only on one year's written notice. ID ¶¶ 763, 765. Olin agreed to supply caustic and chlorine to Monsanto and receive isos in return. *Id.* Olin also had the right under the contract to supply cyanuric acid but never exercised the right as it had discontinued production of cyanuric acid. ID ¶¶ 765, 767. After concluding this agreement with Monsanto, Olin "waterbatched" its trichlor plant. Waterbatching involves maintenance of the plant in a state of greater readiness to resume production than mothballing the plant. ID ¶ 17. When Olin advised Nissan of its agreement with Monsanto, Nissan considered the cyanuric acid supply agreement to be terminated. [17]

By 1984, Olin had attained a significant share of the United States isocyanurates market and was by far the leading producer of dry sanitizers. ID ¶ 583. Despite its success in penetrating the market for isocyanurates, Olin argues that before the acquisition of FMC's assets, it was not a viable producer of isocyanurates. In support of this view, Olin argues that its dependence on Nissan as a supplier of cyanuric acid rendered it vulnerable. Its second argument is that it was at a significant production cost disadvantage as a result of being forced to pay high prices for cyanuric acid. Third, Olin argues that its financial losses in this period demonstrate its nonviability.

Nothing in the record suggests that Olin's leading market share overstates its competitive vigor. Olin asserts that the ALJ overlooked the fact that Nissan was a competitor in the sale of isos and, according to Olin, had the power to exclude Olin from the isos market. RB at 19-20. Citing *Otter Tail Power Co. v. United States*, 410 U.S. 366, 370-71, 377 (1973), Olin argues that Nissan's "stranglehold" over it gave the Japanese firm the ability to control Olin's prices and output. *Otter Tail* by no means establishes a principle that reliance on a competitor as a supplier disables a firm as a matter of law. In *Otter Tail*, the evidence showed that the power company not only refused to deal with municipal power systems, but also refused to carry power produced by others to them and litigated to block alternative means of delivery of power to fledgling competitors. Entirely unlike the situation in *Otter Tail*, the evidence here indicates that Nissan was willing and able to sell cyanuric acid to Olin, and that Nissan did nothing to block Olin from obtaining cyanuric acid from another source. As indicated above, Nissan expanded its capacity to accommodate Olin's wants, and the Japanese company always faithfully delivered on its contractual commitments to Olin. Olin depicts its

vulnerability as a purchaser, while ignoring Nissan's mutual dependence on Olin as the purchaser of a large portion of its cyanuric output. ID ¶¶ 661-62.

If dependence on a competitor made Olin's management concerned about the long-term security of the business, the firm had alternative means, short of acquisition of a major competitor, to increase the stability of the situation. It could, for example, have sought to negotiate a long-term supply contract. It could and in fact did continue to pursue development of a viable technology for the production of its own cyanuric acid. It could and did seek alternative suppliers.

As Judge Hyun found, during the period preceding the decision to enter the Monsanto tolling agreement, Olin made a serious effort to develop a workable cyanuric acid production technology. ID ¶¶ 547-59. The Monsanto tolling agreement did not end these development efforts; on the contrary, they continued through the period after the agreement was signed [18] before the FMC acquisition. *Id.* In its brief, Olin disparages this effort to develop an alternative cyanuric acid technology as an idea that "makes no economic sense," because the company had already been unsuccessful. RB at 25. Olin argues that the ALJ's findings rest on documents prepared by employees, and that Olin officials testified that the Board would never have approved further spending on cyanuric acid. RB at 26. It is impossible to know with certainty what Olin's Board of Directors would have done if presented with a viable plan to produce cyanuric acid. We cannot assume, however, that the Board would have turned down any plan, no matter how sound.

Olin's second argument is that it suffered a severe cyanuric acid cost disadvantage vis-a-vis Monsanto and Nissan, and that this in turn put Olin at a cost disadvantage in the production of isocyanurates. RB at 20-23. Although a manufacturing cost disadvantage may weaken a competitor (particularly absent other strengths), Olin's claim that its significant and growing market share masked weakness is unpersuasive. Olin compares the price it paid to Nissan for cyanuric acid with figures purporting to be Monsanto's and Nissan's cost of cyanuric acid production. RB at 21. These comparisons fail to establish Olin as a weakened competitor.¹⁵ FMC's standard cost of making cyanuric acid

¹⁵ Olin's claimed cyanuric acid and isos cost disadvantage is not based on reliable data. The comparisons of Monsanto's cost with Nissan's price is not reliable because the Monsanto cyanuric acid was at a less advanced stage of processing than the Nissan product and did not include all costs, such as overhead. Tr. at 3950, 4060-63. Olin's claim about Nissan's cost rests on a document not explained by any Nissan or other knowledgeable witness. RX 263A. Based on other information, Olin managers made a considerably different estimate of Nissan's costs. ID at 704. Although we are not in a position to make definitive findings on Nissan's production

(footnote cont'd)

was higher than the price Olin had agreed to pay to Nissan. ID ¶¶ 689-90. If the cyanuric acid cost disadvantage was the driving force behind Olin's business strategy, it hardly seems reasonable to purchase a plant whose cost of production was higher than Nissan's selling price.

Finally, Olin argues that its financial losses since its entry into the production and sale of isos demonstrate its lack of viability. It seems clear that after Olin entered the isocyanurates business in 1980, it incurred substantial financial losses on those operations. RB at 20. The cause of those losses, however, is not easy to pin down. Olin would now have us find that the losses demonstrate its lack of viability as an [19] independent producer. Other explanations seem more credible. Olin itself offered another explanation to the International Trade Commission in the antidumping proceeding involving cyanuric acid and its derivatives. Although Olin now suggests that its July 1984 decision to sign the tolling agreement with Monsanto was due to its lack of viability as a domestic producer, a contemporaneous brief to the ITC contains no hint whatsoever that Olin was not a viable isos producer.¹⁶ On the contrary, Olin's brief affirmatively points to low prices by Japanese producers as the source of the problems of the domestic industry. CX 376G-M.

Olin has not made a persuasive showing that the losses demonstrate its lack of viability because there are other reasons that would appear to account for the losses. In the early 1980's, Olin was a new entrant in the production and sale of isos. It incurred costs to promote its new brand name for this pool chemical. ID ¶ 374. At the same time, it experienced difficulties with the start up of its acid plant, the dichlor plant and the packaging plant. RPF 163, 173. Strategic planning documents prepared by Olin employees in the period from 1982-1984 blame the company's problems on industry overcapacity. CX 259Q, CX 260G, CX 261A, CX 266B. Those strategic planning documents do not reflect a decision or consensus that the firm must exit the isos industry due to a lack of viability.

B. FMC's Preacquisition Market Position

Olin also argues that FMC's market share at the time of the acquisition overstated its effectiveness as a competitor. *United States*

costs, Olin has not pointed to solid evidence to show that it is at a cost disadvantage that makes its market share overstate its actual market power.

¹⁶ On March 9, 1984, Olin filed a "Pre-Hearing Brief of Olin Corporation" with the ITC in connection with the antidumping proceeding. CX 376.

v. General Dynamics Corp., 415 U.S. 486, 489 (1974). FMC has been a producer of isos since 1963, and its South Charleston plant was the second largest such facility in the world. ID ¶ 399. In 1978, it began the distribution of branded isos and thereafter undertook a major promotional effort to establish the “SUN” brand of pool sanitizers. ID ¶ 402. FMC earned a reputation for aggressive pricing. ID ¶¶ 403-06.

In 1979, FMC undertook a review of the profitability of all its business operations with a view toward divesting any units with profitability below the corporation’s internal standards. ID ¶¶ 407-10. The CDB unit, which included isocyanurates, failed to meet the corporate “hurdle rates” for continuation as part of [20] FMC. ID ¶ 412.¹⁷ In 1980, FMC’s corporate planning department predicted that improvement in the isos business was unlikely, and the company adopted an operating mode of “maintain-and-selectively-invest.” ID ¶ 416.

During the 1982 corporate planning process, the management of the CDB unit recommended that FMC exit the business, and other units supported this recommendation. ID ¶¶ 417-18. FMC shifted the CDB unit to the “run/sell” mode of operation, under which it was contemplated that FMC would continue to operate the business until such time as an acceptable purchaser could be identified. ID ¶ 420.¹⁸ In 1984, a strategic plan update was prepared, recommending a continuation of operation in the run/sell mode and rejecting the option of a shutdown, which top management affirmed in the fall of 1984. ID ¶ 423; Tr. 3863.

The value of the CDB business unit as an operating entity actually improved during the period preceding this acquisition. At the time of the 1982 strategic review, the net present value of continued operations was close to the liquidation value, but in the 1984 review, the net present value of continued operations was more than double the liquidation value. ID ¶¶ 427-28. At the time of the sale, the CDB unit was profitable, and profits were expected to continue. ID ¶¶ 429-30. During the time from 1980 to 1984 when FMC was not fully committed to the isos business, FMC believed its market share increased significantly. ID ¶¶ 432-33.¹⁹

Olin argues that the ALJ failed to “appreciate” the likelihood that

¹⁷ Because of FMC’s internal accounting procedures, it is difficult to evaluate the stand-alone profitability of the pool chemicals business. ID ¶ 413.

¹⁸ This decision did not mean that the company discontinued all investment. The company continued to invest in debottlenecking the plant’s isos capacity. ID ¶ 420.

¹⁹ After 1982, FMC reduced its promotional efforts and dealer support. ID ¶ 434. In December 1984, FMC wrote off the CDB assets and took a charge against corporate earnings. ID ¶ 435.

FMC's assets would have exited the industry absent this acquisition. RB at 32. Olin, however, has made no showing that the FMC swimming pool chemicals business was not viable or would have exited the market. At most, the evidence indicates that this business unit did not meet FMC's internal, corporate profit objectives, and the company planned to divest [21] the assets.²⁰ While such evidence may suggest that FMC would exit the market, it does not suggest that the assets would exit.

IV. EFFECT ON COMPETITION

Section 7 of the Clayton Act forecloses incipient competitive problems by prohibiting mergers the effect of which "may be substantially to lessen competition, or to tend to create a monopoly." 15 U.S.C. § 18 (1982); *United States v. Philadelphia National Bank*, 374 U.S. 321, 362 (1963).²¹ Indeed, the statute's prospective focus is fundamental to *United States v. General Dynamics Corp.*, 415 U.S. 486, 503, 505 (1974), in which the Supreme Court directed attention to the likely impact of the merger on future competition in the relevant market.

A. *The Dry Sanitizer and Isocyanurates Markets Are Highly Concentrated*

The fewer the competitors in a market, the easier it becomes for the firms to coordinate price and output decisions. *United States v. Aluminum Co. of America*, 377 U.S. 271, 280-81 (1964); *Brown Shoe Co. v. United States*, 370 U.S. 294, 343-45 (1962); *Hospital Corporation of America v. FTC*, 807 F.2d 1381, 1387 (7th Cir. 1986) (Posner, J.); see *Justice Merger Guidelines* § 3.1 (1984). The dry pool sanitizer market, including both cal hypo and isocyanurates, is highly concentrated by virtually any measure employed in antitrust analysis. On the basis of United States production capacity in 1985, the post-acquisition Herfindahl-Hirschmann Index ("HHI") is 3852, with an increase in the HHI of over 1065 points. ID ¶ 569. On the basis of United States production in 1984, the post-acquisition HHI is 4122, with an increase of 1186. ID ¶ 569. Olin's share of production capacity for dry pool sanitizers is 57 percent. *Id.* The post-merger four-firm concentration ratio approaches 95 percent. ID ¶ 571.

²⁰ An August 1984 FMC planning document indicates that the unit's profitability had improved, that the present value of continued operations was considerably greater than the liquidation value, and that there was an opportunity to sell the business. CX 29.

²¹ See *United States v. Penn-Olin Chemical Co.*, 378 U.S. 158, 170-71 (1964) (comparing standards).

The concentration in the dry sanitizer market and increase in concentration caused by this merger are far greater than the levels of concentration that typically signal an excessive danger of anticompetitive effect. Section 3.11 of the *Justice Merger Guidelines* states: "if the increase in the HHI exceeds 100 and the post-merger HHI substantially exceeds 1800, only in [22] extraordinary cases will such factors [the factors discussed in sections 3.2 to 3.5] establish that the merger is not likely to lessen competition." This merger will raise the level of concentration to a level more than double the 1800-point threshold at which the Department is likely to challenge mergers.

Olin's acquisition of FMC's pool chemical business produced a degree of concentration in the dry sanitizer market extremely high in comparison to recent Commission merger precedent. In *B.F. Goodrich Co.*, 110 FTC 207, 313 (1988), the Commission found a violation of Section 7 in the vinyl chloride monomer market in which the acquisition in question increased the HHI based on practical production capacity by 253 points to 1552. In *Hospital Corporation of America*, 106 FTC 361, 487-88 (1985), *aff'd*, 807 F.2d 1381 (7th Cir. 1986), the Commission considered a market with a post-acquisition HHI of at least 2416, which the Commission found "to be of serious competitive concern. . . ." The Commission found liability and ordered divestiture. In *Weyerhaeuser Co.*, 106 FTC 172, 280 (1985), although the Commission found no violation of Section 7 where the HHI increased by 211 points to 1166, the decision was based on consideration of industry characteristics other than concentration.

We find that the level of concentration in the dry sanitizer industry and the increase in concentration caused by this acquisition raise serious competitive concerns. Nonetheless, the seriousness of these concerns does not foreclose examination of particular characteristics of competition in the market to determine if extraordinary circumstances rebut the signal of competitive hazard given by the industry structure. The level of concentration in the isocyanurates-only market proposed by Olin is also very high. In the isos-only market, based on 1985 United States capacity data, the post-acquisition HHI would be 3826 with an increase in the HHI of 1114. On the basis of 1984 United States production data for the isos-only market, the post-acquisition HHI is 3467 and the increase in the HHI is 702. ID ¶ 576. These concentration levels are similar to the concentration levels in the dry pool sanitizer market and raise the same competitive concerns.

B. *Entry Is Not Easy*

The ease or difficulty of entry is “perhaps the most important qualitative factor” in assessing whether anticompetitive conduct is likely. *FTC Merger Statement* at 5 (1982). If entry is easy, then price-elevating collusion may be defeated by an outsider. See, e.g., *United States v. Waste Management Inc.*, 743 F.2d 976, 982-84 (2d Cir. 1984); *Echlin Manufacturing Co.*, 105 FTC 410 (1985). Since absolute barriers to entry, such as control of all reserves of some necessary ingredient, rarely exist, it is useful to assess the [23] magnitude of barriers or impediments to entry in terms of the amount of time required for a motivated outsider to effect entry. The *Justice Merger Guidelines*, Section 3.3, employ a two-year threshold in considering the likelihood of entry. The longer the time required for successful entry, the greater the likelihood of a challenge to a horizontal merger.

Olin’s not inconsiderable difficulty in establishing itself as an integrated producer of isocyanurates suggests that entry in this industry is problematic. Olin’s Chairman and Chief Executive Officer estimated that it would take ten years to effect new entry in the production of trichlor. ID ¶714. Others estimated that even giant chemical companies would take from three to five years to enter. ID ¶715. The development of technology and the acquisition of manufacturing know-how and experience to produce this chemical cause entry to be a lengthy process. ID ¶716.

Similar problems confront a firm considering entry in the production of calcium hypochlorite. Olin employees estimated that a *de novo* entrant would need five to eight years to develop the manufacturing technology necessary to produce the chemical. ID ¶¶728-29. These estimates are confirmed by the experience of PPG, which took six years to develop the technology, build a plant at Natrium, West Virginia, and achieve initial production. ID ¶732. Indeed, since PPG had a long history of experience in producing cal hypo before starting on the Natrium plant, it seems likely that a novice producer might require more than six years to enter effectively. ID ¶733.

Overall, the evidence indicates that entry by new competitors is unlikely to defeat anticompetitive behavior in the dry sanitizer market for many years. This long lead time merely increases concern about the hazard of anticompetitive conduct.

C. Industry Propensity For Anticompetitive Conduct

In 1984, Olin, which was the third largest domestic producer of isocyanurates, entered an agreement with Monsanto, the leading producer of isos, to purchase sufficient isos to cover Olin's anticipated needs ("Agreement"). CX 469. The Agreement was effective July 1, 1984, and ran at least two and one-half years until December 31, 1986, after which date, it was terminable on twelve months written notice. CX 469B. For the last six months of 1984, the Agreement provided for sales of one million pounds per month; thereafter, it provided for sales of 2.5 to 4 million pounds per quarter. CX 469B-C.

Under the Agreement, Olin provided chlorine and caustic, and had the option to provide cyanuric acid. The Agreement set forth formulas for determining the fee for conversion of the chlorine and caustic to isos. CX 469D. The Agreement also contained [24] liquidated damages provisions for shortfalls in performance. CX 469Q-R.²²

The evidence strongly indicates that Olin saw the Agreement not as a way to reduce the costs of operating its plant but as a way to reduce output and increase prices. The record indicates that the plan was under consideration for some time before it was implemented. In January 1983, Mr. Swartley, who was President of Olin's consumer Products Group, prepared a document discussing the option of suspending production and marketing purchased isos. ID ¶¶ 28, 768-69; CX 327. The memorandum states: "*Removing production capacity from the market may improve profit potential. With less obvious volume pressure, pricing should be improving over time.*" CX 327 (emphasis in original). Mr. Swartley's view was that an agreement such as the one with Monsanto would reduce the surplus of trichlor on the market and would have a positive impact on pricing. Tr. 7431.

Other Olin documents indicate that the company's management was well aware of the price effect of removing its output from the market. ID ¶¶ 768-81. The "1984 Pace Strategic Plan," dated April 23, 1984, compares the alternatives of continued isos production with the Monsanto tolling agreement alternative. For the "business as usual" option, the general projection is "continued depressed industry prices," but for the Monsanto tolling alternative, it projects "recovery of industry prices." CX 261C.²³ The plan projects "netbacks" under

²² After the Agreement was signed, Olin "waterbatched" its isocyanurates plant at Lake Charles. See discussion *supra* at 16.

²³ An Olin corporate vice president initiated the contacts with Monsanto that led to the Agreement by telephoning a high level Monsanto executive in January 1984. ID ¶ 764.

the two alternatives. Under the Monsanto tolling option, the projected prices would be 24 to 30 cents per pound higher than under a scenario with continued Olin production of isos. *Compare* CX 261E with CX 261G. A financial analysis of the proposed Monsanto Agreement, prepared for the Chief Executive Officer of Olin on May 7, 1984, predicts a lower sales volume but states: "Accelerated market price increases associated with a more balanced supply/demand position than nominal increases in the 'Business As Usual' [operating mode]." CX 659A.²⁴

The Monsanto Agreement was apparently not signed to reduce the manufacturing costs of isos to Olin, as Olin now argues. In December 1984, a "Pace Business Review" was prepared for presentation to Olin's Chief Executive Officer, the Finance [25] Committee, and the Board of Directors. CX 263. This document indicates that the "total manufacturing cost" of isos by Olin using cyanuric acid purchased from Nissan was less expensive than isos purchased under the Monsanto Agreement. CX 263V; Tr. 8181-85.²⁵ It seems reasonable to conclude that price increases, brought about by decreased supply, were in fact the reason for the Monsanto Agreement.

After Olin waterbatched its isos plant, it appears that shortages of isos did occur. ID ¶ 780. Indeed, under the tolling contract, Monsanto paid significant penalties to Olin because of a shortfall in deliveries of isos. RPF 355.

Olin argues that the Monsanto Agreement gave Monsanto the funds to increase its isos production capacity and that the long-term effect of these Monsanto capacity expansions was procompetitive. RB at 37-38. A Monsanto witness testified that Monsanto accomplished "debottlenecking" steps during the term of the Agreement. Tr. 4069-70. The witness declined to characterize the capital investment in Monsanto's Sauget trichlor plant as a capacity expansion. The witness stated: "Very little of what we have done has been done for expansion's sake. It has been done to achieve cost reduction." Tr. 4072.²⁶ Presumably Monsanto would have made such cost-justified investment regardless of the Monsanto-Olin Agreement, and the record does not support Olin's attempt to tie the Monsanto investment to the Agreement.

²⁴ The document also projected some savings on fixed costs. *Id.*

²⁵ The Olin financial analyst who prepared the comparison of the manufacturing costs testified at the hearing that the Olin manufacturing cost that was compared with the Monsanto cost at CX 263V was the Olin cost using purchased cyanuric acid. Tr. 8184-85.

²⁶ The witness repeated that the Sauget investment should not be "termed as expansion" because it was driven by cost reduction motives. Tr. 4075.

D. Import Competition

Olin argues that imports limit the ability of domestic producers to collude successfully. Imports represented approximately nine percent of United States dry sanitizer capacity in 1985, ID ¶ 583, Table 3, and about twelve percent of United States dry sanitizer production in 1984. ID ¶ 583, Table 5. For isocyanurates alone, imports equalled nineteen percent of United States production in 1984. Virtually all of those imports were produced by two Japanese firms. ID ¶ 583, Table 2. [26]

In evaluating the competitive significance of a foreign firm, we consider how much additional output would flow to the United States market in response to a hypothetical, small but significant and nontransitory price increase. See Introduction to the *Justice Merger Guidelines* at Section 3. Because it may be impossible accurately to measure the amount of additional foreign capacity available to increase supply to the United States in response to the price increase, it may be appropriate to employ foreign shipments in the calculations of market concentration. *Id.* That is what the Administrative Law Judge did in this case and, consistent with the *Guideline's* prescription that qualitative evidence may be used to correct any distortion inherent in the quantitative data, ALJ Hyun reviewed the available evidence relating to the capabilities and problems of foreign suppliers in considerable detail.

Qualitative evidence concerning Japan, the major source of foreign dry sanitizer supply, underscores concern about the ability of these producers to defeat a price increase. First, the domestic producers of both isos and cal hypo have obtained antidumping relief against imports of these chemicals from Japan. In June 1983, Monsanto filed an antidumping petition with respect to isos, and antidumping duties were imposed in April 1984. ID ¶ 590. In April 1984, Olin filed an antidumping petition with respect to cal hypo, and an Antidumping Duty Order was entered in April 1985. ID ¶¶ 622, 625. Unlike a quota, an Antidumping Duty Order does not impose an absolute restriction on the volume of imports. Nonetheless, as the ALJ found, the evidence in this record indicates that the Antidumping Duty Order did have a restraining effect on the vigor of import competition. ID ¶¶ 599-622. Witnesses from Japanese exporters testified that the

antidumping findings had restricted the ability of the Japanese firms to compete in the United States. ID ¶¶ 600-04, 607-08, 610-11.²⁷

A second qualitative factor raising concern about the likely competitive strength of the Japanese exporters is the significant shift in the yen to dollar currency exchange rate. ID ¶ 634. The Japanese producers, purchasers of isos and domestic producers all regard the exchange rate as relevant in assessing the viability of Japanese competition. ID ¶¶ 632-40. A change in the exchange rate or any other factor that has the [27] effect of significantly increasing the cost of the Japanese product in United States dollars is a circumstance that bears on the probable future effectiveness of Japanese firms as competitors in this market.

In addition, it appears that clear and reliable information of Japanese production capacity is not available. Capacity estimates from the Japanese firms are in the record, but Olin claims that the estimates are too closely related to actual production to be entirely reliable. RPF 863-68.²⁸ Although the evidence does not conclusively establish that Japanese firms are under tight capacity constraints, it equally provides no basis to conclude that those firms have substantial excess capacity that could be used to supply the United States market in the event of a price increase.

Finally, the Japanese Fair Trade Commission found in 1982 that Nissan and Shikoku, the two leading foreign suppliers of isos to the United States market, had fixed the prices of isocyanurates sold in Japan from 1977 through 1981. ID ¶ 812. This circumstance makes it difficult to accept Olin's position that the foreign competitors are the guarantors of competition in the United States market in the event of collusion among the domestic producers.

E. Other Market Characteristics

The dry pool sanitizer market has a number of other characteristics that are at least arguably relevant to the assessment of its likely future competitive performance. Some characteristics tend to heighten the concern raised by the extremely high post-merger market

²⁷ Olin criticizes the Administrative Law Judge for relying on import data through 1985 and not considering the level of imports in 1986 and 1987. RB at 41-42. Since the hearing was in March and April 1987, the ALJ could hardly know what the 1987 import levels would be. Olin's brief at page 42 cites only its own proposed findings of fact to support the claim that imports were higher in 1986 than earlier years. These proposed findings of fact in turn cite only anecdotal testimony.

²⁸ Although the uncertainty regarding Japanese capacity gives us pause about finding that capacity constraints preclude further exports to the United States, it supports our conclusion that the Administrative Law Judge made an appropriate choice in using actual shipment data as the basis for measuring import competition in the HHI calculation.

concentration. Others may point in the opposite direction, but none of these provides sufficient comfort to alleviate the other concerns about competitive effects.

The Administrative Law Judge found that demand for dry pool sanitizers is relatively inelastic. ID ¶¶ 814-15. A homeowner with an existing swimming pool is relatively unlikely to stop or reduce his or her consumption of swimming pool chemicals because of an increase in the price of those chemicals. This relative inelasticity of demand tends to heighten the antitrust concern raised by the market concentration figures because it indicates [28] that price-elevating collusion has the potential to be quite profitable.²⁹

The Administrative Law Judge recognized that the relative size of the buyers and the flow of orders may affect the likelihood of collusion. We agree with Judge Hyun that none of the 30 to 40 repackager purchasers of dry sanitizers accounted for a large enough proportion of a supplier's total sales to be able to ensure that the market would perform competitively. ID ¶¶ 822-27.

Olin argues, nevertheless, that the sophistication of the buyers of dry sanitizers will make collusion unlikely. RB at 39. Although "sophistication" is a relatively difficult attribute to quantify, it is possible to compare the relative flexibility of the repackagers and the producers. Given the difficulty of entry in the production of isos and cal hypo, the repackagers could not easily counter a collusive price increase by integrating backward. The manufacturers, on the other hand, likely would find it not nearly so troublesome to expand their packaging and distribution capability to eliminate the role of the repackager. Once the chemical has been manufactured, it seems safe to assume that filling drums and smaller packages is relatively easy. Given the respective roles in the industry of manufacturers and repackagers, buyer sophistication appears to be a weak prop to ensure the competitiveness of the market.

Further, the ALJ concluded that the manufacturers do not all sell at the same level of distribution and that this circumstance decreases the likelihood of collusion. ID ¶¶ 839-46. Such a difference may make enforcement of a cartel more difficult if prices must be adjusted to reflect the different levels of trade. R. Posner, *Antitrust Law* 60 (1976). Here, as Judge Hyun found, the manufacturers know the cost

²⁹ The Administrative Law Judge also found that the relatively high ratio of fixed costs to variable costs in this industry contributes to the likelihood of actual or tacit collusion. ID ¶¶ 816-18. As the respondent points out, there is some academic debate about this circumstance as an indicator of likely competitive behavior, and we do not give it any significant weight.

of the repackaging step, and the adjustment to account for it should not pose a great difficulty for a possible cartel. Finally, as the ALJ found, members of this industry exchange information and monitor prices with sufficient intensity to increase the likelihood of collusion. ID ¶¶ 793-811. The availability of price information is another characteristic that supports our concern about increasing concentration in this market. [29]

V. THE “EXITING ASSET” DEFENSE

Olin argues that the Commission should adopt a novel “exiting asset” defense to Section 7 of the Clayton Act. This defense, which has been proposed as a replacement for the traditional failing company defense, would require proof that absent the merger, the acquired firm’s assets would shortly leave the market. *See Kwoka & Warren-Boulton, Efficiencies, Failing Firms and Alternatives to Merger: A Policy Synthesis*, 31 Antitrust Bull. 431, 446 (1986).

Olin asserts that the evidence discussed above in Section IIIB in connection with its argument that FMC’s market share overstates its competitive position also establishes the factual basis for the proposed “exiting asset” defense. As we have discussed, however, the evidence does not establish that FMC made the decision to close the isos business in the near future. Quite the contrary, the record indicates that FMC’s management continued to operate the facility in the expectation that the facility could at some point be sold. In addition, the record does not contain evidence that FMC’s management had conducted an exhaustive effort to sell the package of assets sold to Olin. The record contains no indication that no less anticompetitive alternative to the merger is available. In short, the facts would not support the description of the proposed defense, even if we adopted the defense, and we decline to do so in this case.

VI. DIVESTITURE IS THE APPROPRIATE RELIEF

Judge Hyun ordered Olin to divest the assets acquired from FMC except for the so-called Sulfolane technology to produce cyanuric acid. We think this is appropriate.

Olin argues that the divestiture order is improper and punitive because it requires divestiture of not only the isos production facility, but also the cyanuric acid plant, both of which are located at South Charleston, West Virginia. Olin asserts that the only possible lessening of competition occurred in the market for swimming pool sanitizers, and that cyanuric acid is not such a sanitizer. RB at 51.

Judge Hyun rejected that argument on the ground that divestiture of the cyanuric acid plant together with the isos plant is necessary to ensure the viability of the divested entity. ID ¶ 894. Olin asserts that this judgment is inconsistent with the conclusion that Olin's isos facilities were a viable force in the market even without a cyanuric acid plant.

The purpose of the remedy is to restore the competition that existed before the unlawful acquisition, and divestiture is a simple and sure way to accomplish that. *United States v. E. I. duPont de Nemours & Co.*, 366 U.S. 316, 331 (1961). Complete [30] divestiture is "particularly appropriate" in merger cases. *Ford Motor Co. v. United States*, 405 U.S. 562, 573 (1972). In fashioning a remedy for an unlawful acquisition, the Commission has ordered broad divestiture in order to increase the likelihood of a restoration of competition even if changed circumstances have made a complete restoration impossible. *See RSR Corp.*, 88 FTC 800, 892-97 (1976), *aff'd*, *RSR Corp. v. FTC*, 602 F.2d 1317 (9th Cir. 1979), *cert. denied*, 445 U.S. 927 (1980).

The isos and cyanuric acid facilities are located at the same plant in South Charleston, West Virginia. No suggestion has been made that FMC ever offered, or even considered offering, the cyanuric acid plant for sale separate from the isos plant. Olin failed to introduce evidence that the two facilities are separate, stand-alone operations, rather than integrated facilities that share common facilities for power, emission control, receiving and shipping, and other functions. The record does not support a conclusion that the isos plant would be technically and functionally viable separate from the cyanuric acid plant, quite apart from the question whether it would be commercially viable. Since the objective of requiring divestiture is to create a new competitor in this market, we must ensure that the package of assets divested is sufficient to give its acquiror a real chance at competitive success.

We conclude that Olin's acquisition of FMC's swimming pool chemical business is likely substantially to lessen competition in the markets for dry pool sanitizers and isocyanurates in violation of Section 7 of the Clayton Act and Section 5 of the FTC Act. We further conclude that divestiture of all assets covered by the Asset Maintenance Agreement, except the Sulfolane process, is the necessary and appropriate remedy.

FINAL ORDER

This matter has been heard by the Commission on the appeal of respondent from the initial decision, and on briefs and oral argument in support of and in opposition to the appeal. For the reasons stated in the accompanying opinion, the Commission has determined to deny the appeal. Accordingly,

It is ordered, That the findings of fact and initial decision of the Administrative Law Judge be adopted insofar as not inconsistent with the findings of fact and conclusions of law contained in the accompanying opinion.

It is further ordered, That the following order be, and hereby is, entered:

The following definition shall apply in this order:

1. “FMC” means the FMC Corporation swimming pool chemicals business acquired by Olin Corporation from FMC Corporation, and specified in the *Agreement to Maintain Isocyanurate Assets and to Terminate the Monsanto Tolling Agreement*, an agreement entered into by Olin Corporation and the Federal Trade Commission, dated July 18, 1985, together with all of the assets, title and properties, tangible and intangible of said business, and its associated interests, rights and privileges, including without limitation all buildings, leaseholds, machinery, equipment, raw material reserves, inventory, customer lists, copyrights, trade names, trademarks, trade secrets, patents and other property of whatever description, together with all additions and improvements thereto made subsequent to the acquisition. [2]

I.

It is further ordered, That respondent Olin Corporation, a corporation, including its successors and assigns, and its officers, directors, agents, representatives, employees, subsidiaries and affiliates (hereafter “Olin”), shall divest, subject to the prior approval of the Commission, FMC within twelve (12) months from the date this order becomes final.

II.

It is further ordered, That the divestiture required by this order

shall be accomplished absolutely and in good faith and shall transfer the assets to be divested as a viable, competitive concern engaged in the manufacture and sale of swimming pool chemicals, *provided, however*, that the Sulfolane process technology and know-how for the manufacture of cyanuric acid may be excluded from the divestiture required by this order.

III.

It is further ordered, That pending any divestiture required by this order, Olin shall not cause or permit impairment of the marketability or viability of FMC.

The Federal Trade Commission may seek civil penalties and other relief available to it pursuant to § 5(1) of the Federal Trade Commission Act, 15 U.S.C. 45(1), or any other statute enforced by the Commission, for any failure by Olin to comply with this order, and the appointment of a trustee or the failure to appoint a trustee hereunder shall not preclude the Federal Trade Commission from seeking such civil penalties or other relief.

IV.

It is further ordered, That if Olin has not divested all of the properties, assets, or enterprises required to be divested pursuant to Paragraphs I and II of this order within the twelve-month period provided therein, the Federal Trade Commission may appoint a trustee to effect divestiture and bring an action pursuant to § 5(1) of the Federal Trade Commission Act, 15 U.S.C. 45(1), or any other statute enforced by the Commission, to appoint a trustee to effect divestiture. The trustee shall be a person with experience and expertise in acquisitions and divestitures.

Any trustee appointed by the Federal Trade Commission pursuant to this paragraph shall have the following powers, authority, duties, and responsibilities: [3]

A. The trustee shall have the exclusive power and authority to divest any properties required to be divested pursuant to Paragraph I of this order that have not been divested by Olin within the time period for the divestiture provided therein. The trustee shall have twelve (12) months from the date of appointment to accomplish the divestiture, which shall be subject to the prior approval of the Federal

Trade Commission. The Federal Trade Commission or the court may extend the appointment of the trustee if necessary to facilitate divestiture.

B. The trustee shall have full and complete access to the personnel, books, records and facilities of any of the properties that the trustee has the duty to divest, and Olin shall develop such financial or other information relevant to the properties to be divested as the trustee may reasonably request. Olin shall cooperate with the trustee and shall take no action to interfere with or impede the trustee's accomplishment of the divestiture.

C. The power and authority of the trustee to divest shall be at the most favorable price and terms available consistent with this order's absolute and unconditional obligation to divest, and the purposes of the divestiture as stated in Paragraphs I and II of this order.

D. The trustee shall serve, without bond or other security, at the cost and expense of Olin on such reasonable and customary terms and conditions as the Federal Trade Commission or a court may set. The trustee shall have the authority to retain, at the cost and expense of Olin, such consultants, attorneys, investment bankers, business brokers, accountants, appraisers, and other representatives and assistants as are reasonably necessary to assist in the divestiture. The trustee shall account for all monies derived from the sale and all expenses incurred. After approval by the Federal Trade Commission of the account of the trustee, including fees for his or her services, all remaining monies shall be paid to Olin and the trustee's power shall be terminated. [4]

E. Within twenty (20) days after the appointment of the trustee, Olin shall transfer to the trustee all rights and powers necessary to accomplish divestiture.

F. Olin shall indemnify the trustee and hold the trustee harmless against any losses, claims, damages, or liabilities to which the trustee may become subject, arising in any manner out of, or in connection with, the trustee's duties under this order, unless the Federal Trade Commission determines that such losses, claims, damages, or liabilities arose out of the misfeasance, gross negligence, or the willful or wanton acts or bad faith of the trustee.

G. If the trustee ceases to act or fails to act diligently, a substitute trustee may be appointed.

H. The trustee may ask the Federal Trade Commission or the court-appointed trustee to issue, and the Federal Trade Commission or the

court may issue, such additional orders or directions as may be necessary and appropriate to accomplish the divestiture required under this order.

I. The trustee shall have no obligation or authority to operate or maintain any of the properties, assets, or enterprises required to be divested pursuant to Paragraph I of this order.

J. The trustee shall report in writing to Olin and the Federal Trade Commission every sixty (60) days concerning the trustee's efforts to accomplish divestiture.

V.

It is further ordered, That for a period of ten (10) years from the date this order becomes final, Olin shall cease and desist from acquiring, directly or indirectly, through subsidiaries or otherwise, without the prior approval of the Commission, the whole or any part of the stock, share capital, or assets of, or any interest in, any concern, corporate or noncorporate, engaged in the manufacture and sale of swimming pool chemicals, including entering into any agreement, understanding or arrangement with any such concern by which Olin would obtain the market share, in whole or in part, of such concern in the manufacture and sale of swimming pool chemicals. [5] One year from the date this order becomes final and annually thereafter Olin shall file with the Commission a verified written report of its compliance with this paragraph.

VI.

It is further ordered, That within sixty (60) days from the date this order becomes final, and every sixty (60) days thereafter, until it has fully complied with Paragraphs I and II of this order, Olin shall submit a report in writing to the Commission setting forth in detail the manner and form in which it intends to comply, is complying or has complied therewith. All such reports shall include, in addition to such other information and documentation as may hereafter be requested: (a) a specification of the steps taken by Olin to make public its desire to divest the FMC swimming pool chemicals assets; (b) a list of all persons or organizations to whom notice of divestiture has been given; (c) a summary of all discussions and negotiations related to divestiture together with the identity and address of all interested persons or

organizations; and (d) copies of all reports, internal memoranda, offers, counteroffers, communications and correspondence concerning said divestiture.

VII.

It is further ordered, That respondent Olin shall notify the Commission at least thirty (30) days before any proposed changes in the corporate respondents which may affect compliance obligations arising out of this order, such as dissolution, assignment or sale resulting in the emergence of successor corporations, or the creation or dissolution of subsidiaries.

Commissioner Strenio recused.

IN THE MATTER OF

GERALD S. FRIEDMAN, M.D., ET AL.

CONSENT ORDER, ETC., IN REGARD TO ALLEGED VIOLATION OF
SEC. 5 OF THE FEDERAL TRADE COMMISSION ACT*Docket C-3290. Complaint, June 18, 1990—Decision, June 18, 1990*

This consent order prohibits, among other things, the California physician and his dialysis centers from: requiring physicians to use his in-patient dialysis service for their patients as a condition for using respondents' out-patient dialysis facilities; barring physicians who want to treat their patients at respondents' out-patient dialysis facilities from owning or operating a competing in-patient dialysis service; and denying, revoking, suspending, or otherwise impairing a physician's staff privileges at one of respondents' out-patient dialysis facilities because the physician has used or operated an in-patient dialysis service other than one owned by respondents. In addition, the consent order requires that respondents distribute a copy of the order and complaint to each physician with privileges at any of the dialysis facilities.

Appearances

For the Commission: *Garry Gibbs.*

For the respondents: *Kendall H. MacVey, Best, Best & Krieger,*
Riverside, CA.

COMPLAINT

Pursuant to the provisions of the Federal Trade Commission Act, as amended, 15 U.S.C. 41 *et seq.*, and by virtue of the authority vested in it by said Act, the Federal Trade Commission, having reason to believe that Gerald S. Friedman, M.D., individually and doing business as the Dialysis Center of Upland, the Dialysis and Transplant Center of Pomona Valley, and the Dialysis Center of Pomona, has violated and is violating Section 5 of the Federal Trade Commission Act, and that a proceeding by it in respect thereof would be in the public interest, hereby issues this complaint, stating its charges as follows:

RESPONDENTS

PARAGRAPH 1. Respondent Gerald S. Friedman, M.D. ("Dr. Friedman") is a physician licensed to practice medicine in the State of