

UNITED STATES OF AMERICA  
BEFORE FEDERAL TRADE COMMISSION

In the matter of

CADENCE DESIGN SYSTEMS, INC.,  
a corporation.

File No. 971-0033

AGREEMENT CONTAINING CONSENT ORDER

The Federal Trade Commission ("Commission") having initiated an investigation of the proposed acquisition by Cadence Design Systems, Inc. ("Cadence") of Cooper & Chyan Technology, Inc. ("CCT"), and it now appearing that Cadence is willing to enter into an Agreement Containing Consent Order ("Agreement") to promote the development of open interfaces and to provide for other relief,

IT IS HEREBY AGREED by and between Cadence, by its duly authorized officers and its attorneys, and counsel for the Commission that:

1. Proposed respondent Cadence is a corporation organized, existing, and doing business under and by virtue of the laws of the State of Delaware, with its office and principal place of business located at 2655 Seely Road, San Jose, California 95134.
2. Cadence admits all the jurisdictional facts set forth in the draft of Complaint here attached.
3. Cadence waives:
  - (a) any further procedural steps;

(b) the requirement that the Commission's decision contain a statement of findings of fact and conclusions of law;

(c) all rights to seek judicial review or otherwise to challenge or contest the validity of the Order entered pursuant to this Agreement; and

(d) any claim under the Equal Access to Justice Act.

4. This Agreement shall not become part of the public record of the proceeding unless and until it is accepted by the Commission. If this Agreement is accepted by the Commission it, together with the draft of Complaint contemplated thereby, will be placed on the public record for a period of sixty (60) days and information in respect thereto publicly released. The Commission thereafter may either withdraw its acceptance of this Agreement and so notify Cadence, in which event it will take such action as it may consider appropriate, or issue and serve its Complaint (in such form as the circumstances may require) and decision, in disposition of the proceeding.

5. This Agreement is for settlement purposes only and does not constitute an admission by Cadence that the law has been violated as alleged in the draft of Complaint here attached, or that the facts as alleged in the draft Complaint, other than jurisdictional facts, are true.

6. This Agreement contemplates that, if it is accepted by the Commission, and if such acceptance is not subsequently withdrawn by the Commission pursuant to the provisions of § 2.34 of the Commission's Rules, the Commission may, without further notice to Cadence, (1) issue its Complaint corresponding in form and substance with the draft of Complaint here attached and its decision containing the following Order in disposition of the proceeding and (2) make information public with respect thereto. When so entered, the Order shall have the same force and effect and may be altered, modified or set aside in the same manner and within the same time provided by

statute for other orders. The Order shall become final upon service. Delivery by the U.S. Postal Service of the Complaint and decision containing the agreed-to Order to Cadence's address as stated in this Agreement shall constitute service. Cadence waives any right it may have to any other manner of service. The Complaint may be used in construing the terms of the Order, and no Agreement, understanding, representation, or interpretation not contained in the Order or the Agreement may be used to vary or contradict the terms of the Order.

7. Cadence has read the proposed Complaint and Order contemplated hereby. Cadence understands that once the Order has been issued, it will be required to file one or more compliance reports showing that it has fully complied with the Order. Cadence further understands that it may be liable for civil penalties in the amount provided by law for each violation of the Order after it becomes final.

## ORDER

### I.

IT IS ORDERED that, as used in this Order, the following definitions shall apply:

A. "Cadence" means Cadence Design Systems, Inc., its directors, officers, employees, agents and representatives, predecessors, successors, and assigns; its subsidiaries, divisions, groups and affiliates controlled by Cadence Design Systems, Inc., and the respective directors, officers, employees, agents, and representatives, successors, and assigns of each.

B. "CCT" means Cooper & Chyan Technology, Inc., a company organized, existing, and doing business under and by virtue of the laws of the State of Delaware, with its office and principal place of business located at 1601 South De Anza Boulevard, Cupertino, California 95014.

- C. "Respondent" means Cadence.
- D. "Commission" means the Federal Trade Commission.
- E. "Acquisition" means the acquisition by Cadence of CCT.
- F. "Independent Software Interface Programs" means Respondent's Connections

Program™, any successor program thereto, or other licensing program, promotional program or other arrangement by which Respondent enables independent software developers to provide interfaces to Respondent's Integrated Circuit Design Tools (including, e.g., licenses to the SKILL Programming Language, the SKILL Development Environment, the Virtuoso Layout Editor, and other intellectual property and documentation made available through such programs).

G. "Integrated Circuit Design Tool" means electronic design automation software for integrated circuit design.

H. "Integrated Circuit Routing Tool" means an Integrated Circuit Design Tool for the automated routing of connections between electronic components within an integrated circuit.

I. "Commercial Integrated Circuit Routing Tool" means an Integrated Circuit Routing Tool marketed for sale or intended by the developer for use other than solely for the developer's internal use.

## II.

IT IS FURTHER ORDERED that:

A. Respondent shall permit developers of Commercial Integrated Circuit Routing Tools to participate in Independent Software Interface Programs. The terms by which developers of Commercial Integrated Circuit Routing Tools participate in Respondent's Independent Software

Interface Programs shall be no less favorable than the terms applicable to any other participants in Respondent's Independent Software Interface Programs.

B. The purpose of this Paragraph II is to enable independent software developers to develop and sell Integrated Circuit Routing Tools for use in conjunction with Respondent's Integrated Circuit Design Tools, in competition with Integrated Circuit Routing Tools offered by Respondent, and to remedy the lessening of competition resulting from the proposed Acquisition as alleged in the Commission's Complaint.

### III.

IT IS FURTHER ORDERED that, for a period of ten (10) years from the date this Order becomes final, Respondent shall not, without prior notification to the Commission, directly or indirectly:

A. Acquire any stock, share capital, equity, or other interest in any concern, corporate or non-corporate, engaged in the development or sale of Integrated Circuit Routing Tools in the United States within the year preceding such acquisition; provided, however, that an acquisition of such stock, share capital, equity or other interest will be exempt from the requirements of this paragraph if it is solely for the purpose of investment and Respondents will hold no more than ten (10) percent of the shares of any class of security; or

B. Acquire any assets used or previously used (and still suitable for use) in the development or sale of Integrated Circuit Routing Tools in the United States; provided, however, that such an acquisition will be exempt from the requirements of this paragraph if the purchase price is less than \$ 5,000,000 (five million dollars).

The prior notifications required by this paragraph shall be given on the Notification and Report Form set forth in the Appendix to Part 803 of Title 16 of the Code of Federal Regulations as amended (hereinafter referred to as "the Notification"), and shall be prepared, transmitted and kept confidential in accordance with the requirements of that part, except that: no filing fee will be required for any such notification; notification shall be filed with the Secretary of the Commission and a copy shall be delivered to the Bureau of Competition; notification need not be made to the United States Department of Justice; and notification is required only of Respondent and not of any other party to the transaction. Respondent shall provide the Notification to the Commission at least thirty (30) days prior to the consummation of any such transaction (hereinafter referred to as the "initial waiting period"). If, within the initial waiting period, the Commission or its staff makes a written request for additional information and documentary material, Respondent shall not consummate the transaction until at least twenty (20) days after complying with such request for additional information and documentary material. Early termination of the waiting periods in this paragraph may, where appropriate, be granted by letter from the Bureau of Competition. Notwithstanding, prior notification shall not be required by this paragraph for a transaction for which notification is required to be made, and has been made, pursuant to Section 7A of the Clayton Act, 15 U.S.C. § 18a.

#### IV.

IT IS FURTHER ORDERED that, within sixty (60) days after the date this Order becomes final, Respondent shall submit to the Commission a verified written report setting forth in detail a full description of the manner and form in which it intends to comply, is complying, and has complied with Paragraph II of this Order.

V.

IT IS FURTHER ORDERED that, one year from the date this Order becomes final, annually thereafter for the next nine (9) years, and at other times as the Commission may require, Respondent shall file with the Commission verified written reports setting forth in detail the manner and form in which Respondent has complied and is complying with this Order.

VI.

IT IS FURTHER ORDERED that Respondent shall notify the Commission at least thirty (30) days prior to any proposed change in the corporate Respondent such as dissolution, assignment, sale resulting in the emergence of a successor corporation, or the creation or dissolution of subsidiaries or any other change in the corporation that may affect compliance obligations arising out of the Order.

VII.

IT IS FURTHER ORDERED that, for the purpose of determining or securing compliance with this Order, upon written request, Respondent shall permit any duly authorized representative of the Commission:

- A. Access, during office hours and in the presence of counsel, to inspect and copy all books, ledgers, accounts, correspondence, memoranda and other records and documents in the possession or under the control of Respondent relating to any matters contained in this Order; and
- B. Upon five (5) days' notice to Respondent and without restraint or interference from it, to interview officers, directors, or employees of Respondent.

VIII.

IT IS FURTHER ORDERED that this Order shall terminate ten (10) years from the date this Order becomes final.

Signed this \_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

FEDERAL TRADE COMMISSION

CADENCE DESIGN SYSTEMS, INC.,  
A CORPORATION

By:

By:

\_\_\_\_\_  
Robert N. Cook  
Attorney  
Bureau of Competition

\_\_\_\_\_  
Joseph B. Costello  
Chief Executive Officer

By:

\_\_\_\_\_  
Morris A. Bloom  
Attorney  
Bureau of Competition

\_\_\_\_\_  
Christopher O.B. Wright  
Counsel for Cadence Design Systems,  
Inc.  
Cooley Godward LLP  
Five Palo Alto Square  
3000 El Camino Real  
Palo Alto, California 94306-2155

Approved:

\_\_\_\_\_  
M. Howard Morse  
Assistant Director  
Bureau of Competition

\_\_\_\_\_  
William J. Baer  
Director  
Bureau of Competition



UNITED STATES OF AMERICA  
BEFORE FEDERAL TRADE COMMISSION

In the matter of

CADENCE DESIGN SYSTEMS, INC.,  
a corporation.

File No. 971-0033

INTERIM AGREEMENT

This Interim Agreement is by and between Cadence Design Systems, Inc., a corporation organized and existing under the laws of the State of Delaware ("Cadence"), and the Federal Trade Commission, an independent agency of the United States Government, established under the Federal Trade Commission Act of 1914, 15 U.S.C. § 41, et seq. (the "Commission").

PREMISES

WHEREAS, Cadence has proposed to acquire all of the voting securities of Cooper & Chyan Technology, Inc. ("CCT") pursuant to the Agreement and Plan of Merger and Reorganization by and between Cadence and CCT, dated October 28, 1996 ("the proposed Merger");

WHEREAS, the Commission is now investigating the proposed Merger to determine if it would violate any of the statutes the Commission enforces;

WHEREAS, if the Commission accepts the Agreement Containing Consent Order ("Consent Agreement") in this matter, the Commission will place it on the public record for a period of at least sixty (60) days and subsequently may either withdraw such acceptance or issue

and serve its Complaint and decision in disposition of the proceeding pursuant to the provisions of Section 2.34 of the Commission's Rules;

WHEREAS, the Commission is concerned that if an understanding is not reached during the period prior to the final issuance of the Consent Agreement by the Commission (after the 60-day public notice period), there may be interim competitive harm;

WHEREAS, the entering into this Interim Agreement by Cadence shall in no way be construed as an admission by Cadence that the proposed Merger constitutes a violation of any statute; and

WHEREAS, Cadence understands that no act or transaction contemplated by this Interim Agreement shall be deemed immune or exempt from the provisions of the antitrust laws or the Federal Trade Commission Act by reason of anything contained in this Interim Agreement.

NOW, THEREFORE, Cadences agrees, upon the understanding that the Commission has not yet determined whether the proposed Merger will be challenged, and in consideration of the Commission's agreement that, at the time it accepts the Consent Agreement for public comment, it will grant early termination of the Hart-Scott-Rodino waiting period, as follows:

1. Cadence agrees to execute the Consent Agreement and be bound by the terms of the Order contained in the Consent Agreement, as if it were final, from the date Cadence signs the Consent Agreement.

2. Cadence agrees that, from the date Cadence signs the Consent Agreement until the first of the dates listed in subparagraphs 2.a. and 2.b., it will comply with the provisions of this Interim Agreement:

a. ten (10) business days after the Commission withdraws its acceptance of the Consent Agreement pursuant to the provisions of Section 2.34 of the Commission's Rules;

or

b. the date the Order is final.

3. Cadence waives all rights to contest the validity of this Interim Agreement.

4. For the purpose of determining or securing compliance with this Interim Agreement, subject to any legally recognized privilege, and upon written request, and on reasonable notice, Cadence shall permit any duly authorized representative or representatives of the Commission:

a. access, during the office hours of Cadence and in the presence of counsel, to inspect and copy all books, ledgers, accounts, correspondence, memoranda, and other records and documents in the possession or under the control of Cadence relating to compliance with this Interim Agreement; and

b. upon five (5) days' notice to Cadence and without restraint or interference from them, to interview officers, directors, or employees of Cadence who may have counsel present, regarding any such matters.

5. This Interim Agreement shall not be binding until accepted by the Commission.

Dated: May 6, 1997.

FEDERAL TRADE COMMISSION

CADENCE DESIGN SYSTEMS, INC.

By:

By:

\_\_\_\_\_  
Stephen Calkins  
General Counsel

\_\_\_\_\_  
R.L. Smith McKeithen  
Vice President and General Counsel

**UNITED STATES OF AMERICA  
BEFORE FEDERAL TRADE COMMISSION**

In the matter of

CADENCE DESIGN SYSTEMS, INC.,  
a corporation.

Docket No.

**COMPLAINT**

Pursuant to the provisions of the Federal Trade Commission Act and the Clayton Act, and by virtue of the authority vested in it by said Acts, the Federal Trade Commission, having reason to believe that Cadence Design Systems, Inc. proposes to merge with Cooper & Chyan Technology, Inc. in violation of Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. § 45, and in violation of Section 7 of the Clayton Act, as amended, 15 U.S.C. § 18, and it appearing to the Commission that a proceeding in respect thereof would be in the public interest, hereby issues its complaint stating its charges as follows:

**I. THE RESPONDENT**

1. Respondent Cadence Design Systems, Inc. ("Cadence") is a corporation organized, existing, and doing business under and by virtue of the laws of the State of Delaware, with its office and principal place of business located at 2655 Seely Road, San Jose, California 95134. Cadence has annual worldwide sales of approximately \$741 million, nearly all of which is attributable to electronic design automation products and services, and more than \$70 million of which is attributable to sales of integrated circuit layout environments.

2. At all times relevant herein, the respondent has been, and is now, a corporation as "corporation" is defined in Section 4 of the Federal Trade Commission Act, 15 U.S.C. § 44; and at all times relevant herein, the respondent has been, and is now, engaged in commerce as "commerce" is defined in Section 4 of the Federal Trade Commission Act, 15 U.S.C. § 44, and Section 1 of the Clayton Act, 15 U.S.C. § 12.

## **II. THE PROPOSED MERGER**

3. Cooper and Chyan Technology, Inc. ("CCT") is a corporation organized, existing, and doing business under the laws of Delaware. CCT has annual worldwide sales of approximately \$37.6 million, of which approximately \$13 million is attributable to integrated circuit routing tools and related services, with the balance attributable to printed circuit board routing tools and related services.

4. Pursuant to an Agreement and Plan of Merger and Reorganization dated October 28, 1996, Cadence plans to acquire control of CCT by exchanging Cadence voting securities for the outstanding voting securities of CCT in a transaction valued at more than \$400 million (the "Proposed Merger").

## **III. THE RELEVANT MARKETS**

5. Research, development, and sale of constraint-driven, shape-based integrated circuit routing tools constitute one relevant line of commerce within which to analyze the competitive effects of the Proposed Merger. A constraint-driven, shape-based integrated circuit routing tool is software used to automate the determination of the connections between the electronic

components within an integrated circuit. An integrated circuit is a complex electronic circuit that consists of as many as five million or more miniature electronic components — such as transistors, resistors, capacitors, and diodes — on a piece of semiconductor material smaller than a postage stamp.

6. There are no acceptable substitutes for constraint-driven, shape based integrated circuit routing tools. Routing tools based on other technology cannot accommodate unique problems that arise at deep submicron scales of integrated circuit design (less than .35 micron). Furthermore, at deep submicron scales of design, it is not commercially feasible to route integrated circuit designs without automation. Given the sheer complexity and density of deep submicron integrated circuit designs, as well as the intense time-to-market pressures faced by semiconductor companies in today's fast-paced electronics industry, hand routing is not an alternative for the timely and accurate design of integrated circuits.

7. Integrated circuit layout environments also constitute a relevant line of commerce in which to analyze the competitive effects of the Proposed Merger. Integrated circuit layout environments are software infrastructures within which integrated circuit designers access integrated circuit layout tools, including constraint-driven, shape-based routing tools. Integrated circuit layout tools and integrated circuit layout environments are used during the physical design stage of the integrated circuit design process. The physical design stage is distinct from, and occurs after, the logical design stage of the integrated circuit design process.

8. The relevant geographic market within which to analyze the Proposed Merger is worldwide.

#### **IV. CONCENTRATION**

9. CCT is currently the only firm with a commercially viable constraint-driven, shape-based integrated circuit routing tool. At least one other firm with constraint-driven, shape-based routing technology is in the process of developing a constraint-driven, shape-based integrated circuit routing tool.

10. Cadence is the dominant supplier of integrated circuit layout environments. Cadence's leading competitor in the supply of integrated circuit layout environments is the Avant! Corporation. Avant! and several of its top executives have been charged criminally with conspiracy and theft of trade secrets from Cadence.

#### **V. ENTRY CONDITIONS**

11. There are substantial barriers to entry in the market for constraint-driven, shape-based integrated circuit routing tools. Constraint-driven, shape-based integrated circuit routing tools are technologically complex and difficult to develop. *De novo* entry takes approximately two to three and a half years for a company that already possesses certain underlying core technology that can be used to develop a constraint-driven, shape-based integrated circuit router (such as shape-based routing technology for printed circuit boards). Entry is likely to take even longer for a company that does not possess such technology.

12. In order to achieve the necessary compatibility between the integrated circuit layout tools that they use, integrated circuit designers select integrated circuit layout tools that have interfaces to a common integrated circuit layout environment.

13. Since Cadence is the dominant supplier of integrated circuit layout environments, a constraint-driven, shape-based integrated circuit routing tool that lacks an interface into a Cadence integrated circuit layout environment is less likely to be selected by integrated circuit designers than a constraint-driven, shape-based integrated circuit routing tool that possesses an interface into a Cadence integrated circuit layout environment.

14. An integrated circuit layout environment is not likely to be selected by integrated circuit designers unless a full set of compatible integrated circuit layout tools is available. A full set of integrated circuit layout tools includes at least placement, routing, and analysis and verification tools, each of which must be able to interface into the integrated circuit layout environment that the integrated circuit designer has selected.

## **VI. EFFECTS OF THE PROPOSED MERGER ON COMPETITION**

15. It is in Cadence's interest to make available to users of a Cadence integrated circuit layout environment a complete a set of integrated circuit layout tools, because to do so makes the Cadence integrated circuit layout environment more valuable to integrated circuit designers. Cadence historically has provided access to Cadence integrated circuit layout environments to suppliers of complementary integrated circuit layout tools that Cadence does not supply.

16. Cadence does not, however, have incentives to provide access to a Cadence integrated circuit layout environment to suppliers of integrated circuit layout tools that compete with Cadence products. Cadence historically has been reluctant to provide access to Cadence integrated circuit layout environments to suppliers of integrated circuit layout tools that compete with Cadence products.



17. Prior to the Proposed Merger, Cadence did not have a commercially viable constraint-driven, shape-based integrated circuit routing tool. As a result of the Proposed Merger, Cadence will own the only currently available commercially viable constraint-driven, shape-based integrated circuit routing tool. For this reason, the Proposed Merger will make Cadence less likely to permit potential suppliers of competing constraint-driven, shape-based integrated circuit routing tools to obtain access to Cadence integrated circuit layout environments.

18. Without access to Cadence integrated circuit layout environments, developers are less likely to gain successful entry into the market for constraint-driven, shape-based integrated circuit routing tools.

19. The Proposed Merger will make it more likely that successful entry into the constraint-driven, shape-based integrated circuit routing tool market would require simultaneous entry into the market for integrated circuit layout environments. This need for dual-level entry will decrease the likelihood of entry into the market for constraint-driven, shape-based integrated circuit routing tools.

20. The Proposed Merger may substantially lessen competition or tend to create a monopoly in the market for constraint-driven, shape-based integrated circuit routing tools. The Proposed Merger may, among other things, lead to higher prices, reduced service, and less innovation.

**VII. VIOLATIONS CHARGED**

21. The Proposed Merger of Cadence Design Systems, Inc. and Cooper & Chyan Technology, Inc., described in paragraph 4, violates Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. § 45 and Section 7 of the Clayton Act, as amended, 15 U.S.C. § 18.

WHEREFORE, THE PREMISES CONSIDERED, the Federal Trade Commission on this \_\_\_\_\_ day of \_\_\_\_\_, 1997, issues its complaint against said respondent.

By the Commission.

Seal

Donald S. Clark  
Secretary

Issued:

## **ANALYSIS OF PROPOSED CONSENT ORDER TO AID PUBLIC COMMENT**

The Federal Trade Commission ("Commission") has accepted, subject to final approval, an Agreement Containing Consent Order ("Agreement") from Cadence Design Systems, Inc. ("Proposed Respondent"). The proposed Order is designed to remedy anticompetitive effects stemming from Cadence's proposed acquisition of Cooper & Chyan Technology ("CCT"). On October 28, 1996, Cadence and CCT entered into an Agreement and Plan of Merger and Reorganization whereby Cadence will acquire 100 percent of the issued and outstanding shares of CCT voting securities in exchange for shares of Cadence voting securities valued at more than \$400 million (the "Proposed Merger").

The Commission has reason to believe that the Proposed Merger may substantially lessen competition 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, unless an effective remedy eliminates likely anticompetitive effects. The Agreement Containing Consent Order would, if finally accepted by the Commission, settle charges that Cadence's acquisition of CCT may substantially lessen competition or tend to create a monopoly in the research, development, and sale of constraint-driven, shape-based integrated circuit routing tools.

The proposed Order has been placed on the public record for sixty (60) days. The Commission invites the submission of comments by interested persons, and comments received during this period will become part of the public record. After sixty (60) days, the Commission will again review the Agreement, as well as any comments received, and will decide whether it should withdraw from the Agreement or make final the Agreement's proposed Order.

## **The Proposed Complaint**

According to the Commission's proposed complaint, Cadence is a company that sells various electronic design automation products and services, including integrated circuit layout environments. An integrated circuit (more commonly known as a microchip) is a complex electronic circuit that consists of as many as five million or more miniature electronic components on a piece of semiconductor material smaller than a postage stamp. Integrated circuit design consists of two distinct phases, logical design and physical design. Integrated circuit layout environments, which are used during the physical design phase, are software infrastructures within which integrated circuit designers access integrated circuit layout tools. Approximately \$70 million of Cadence's annual worldwide sales of approximately \$741 million are attributable to sales of integrated circuit layout environments.

The proposed complaint further alleges that CCT is a company that sells integrated circuit routing tools and related services, which account for approximately \$13 million of CCT's annual worldwide sales of approximately \$37.6 million. An integrated circuit routing tool, which is a type of integrated circuit layout tool, is software used to automate the determination of the connections between electronic components within an integrated circuit.

According to the Commission's proposed complaint, a relevant line of commerce within which to analyze the competitive effects of the Proposed Merger is the market for the research, development, and sale of constraint-driven, shape-based integrated circuit routing tools. As integrated circuit designs have become smaller, denser, and faster, the routing of the interconnections between components has become an increasingly important phase of the integrated circuit design process. Routing issues are critical at deep submicron scales of integrated circuit design, which are scales of design smaller than .35 micron (a micron is a

millionth of an inch). The current state-of-the-art design scale is .35 micron, but in the future, integrated circuit designs will shrink to .25 micron and then .18 micron design scales. At deep submicron scales of integrated circuit design, routing is complicated by “cross talk” and other types of electrical interference, timing concerns, design density, and other problems. A constraint-driven, shape-based integrated circuit routing tool is the only kind of routing tool that can correctly accommodate these unique deep submicron integrated circuit routing issues.

The proposed complaint further alleges that there are no acceptable substitutes for constraint-driven, shape-based integrated circuit routing tools. Routing tools based on other technology cannot accommodate the unique deep submicron integrated circuit routing issues described above and thus cannot route deep submicron integrated circuit designs accurately. Routing inaccuracies create serious performance problems, and correcting these problems causes significant design delays. Nor is it commercially feasible for integrated circuit design engineers to route integrated circuit designs without automation (*i.e.*, by “pointing and clicking” between each individual component and each other component to which it must be connected, then going back and correcting any interference or other problems that arise as the routing progresses). Given the sheer complexity and density of deep submicron integrated circuit designs, as well as the intense time-to-market pressures faced by semiconductor companies in today’s fast-paced electronics industry, hand routing is not an alternative for the timely and accurate design of integrated circuits.

The proposed complaint further alleges that CCT is currently the only firm with a commercially viable constraint-driven, shape-based integrated circuit routing tool, although at least one other firm is in the process of developing a constraint-driven, shape-based integrated circuit routing tool that would compete with CCT’s product. The complaint further alleges that

Cadence is the dominant supplier of integrated circuit layout environments. The competitive significance of Avant! Corporation, Cadence's leading competitor in the supply of integrated circuit layout environments, is limited by the fact that Avant! has been charged criminally with conspiracy and theft of trade secrets from Cadence. Several top Avant! executives have been charged criminally as well.

The Commission's proposed complaint further alleges that there are high barriers to entry in the market for constraint-driven, shape-based integrated circuit routing tools, which are technologically complex and difficult to develop. *De novo* entry takes approximately two to three and a half years for a company that already possesses certain underlying core technology that can be used to develop a constraint-driven, shape-based integrated circuit router (for example, shape-based routing technology for printed circuit boards). Entry is likely to take even longer for a company that does not already possess such technology.

According to the Commission's proposed complaint, integrated circuit designers achieve the necessary compatibility between integrated circuit layout tools by selecting tools that have interfaces to a common integrated circuit layout environment. As a result, a constraint-driven, shape-based routing tool that lacks an interface into a Cadence integrated circuit layout environment is less likely to be selected by integrated circuit designers than a constraint-driven, shape-based routing tool that possesses such an interface. Similarly, an integrated circuit layout environment is not likely to be selected by integrated circuit designers unless a full set of compatible integrated circuit design tools is available.

The proposed complaint further alleges that it is in Cadence's interest to make available to users of Cadence integrated circuit layout environments a complete a set of integrated circuit design tools, because to do so makes a Cadence integrated circuit layout environment more

valuable to customers. Historically, Cadence has provided access to its integrated circuit layout environments to suppliers of complementary integrated circuit layout tools that Cadence does not supply. Cadence does not, however, have incentives to provide access to its integrated circuit layout environments to suppliers of integrated circuit layout tools that compete with Cadence products. Cadence historically has been reluctant to provide access to its integrated circuit layout environments to suppliers of competing integrated circuit layout tools.

According to the Commission's proposed complaint, prior to the Proposed Merger, Cadence did not have a commercially viable, constraint-driven, shape-based integrated circuit routing tool. As a result of the Proposed Merger, Cadence will own the only currently available commercially viable constraint-driven, shape-based integrated circuit router. Thus, as a result of the Proposed Merger, Cadence will become less likely to permit potential suppliers of competing constraint-driven, shape-based integrated circuit routing tools to obtain access to Cadence integrated circuit layout environments.

The Commission's proposed complaint alleges that, absent access to Cadence integrated circuit layout environments, developers will be less likely to gain successful entry into the market for constraint-driven, shape-based routing tools. The proposed complaint further alleges that the Proposed Merger will make it more likely that successful entry into the constraint-driven, shape-based integrated circuit routing tool market would require simultaneous entry into the market for integrated circuit layout environments. This need for dual-level entry will further decrease the likelihood of entry into the market for constraint-driven, shape-based integrated circuit routing tools.

The Commission's proposed complaint alleges that the Proposed Merger may substantially lessen competition or tend to create a monopoly in the market for constraint-driven, shape-based

routing tools, which, among other things, may lead to higher prices, reduced services, and less innovation.

### **The Proposed Order**

The proposed Order would remedy the alleged violations by eliminating a significant impediment to entry in the market for integrated circuit routing tools. The proposed Order would require that Cadence permit developers of commercial integrated circuit routing tools to participate in the Cadence Connections Program™, any successor program thereto, or other licensing programs, promotional programs or other arrangements (collectively, “Independent Software Interface Programs”) which enable independent software developers to develop and sell interfaces to Cadence integrated circuit layout tools and Cadence integrated circuit layout environments.

The proposed Order would require that Cadence allow independent developers of commercial integrated circuit routing tools to participate in Cadence’s Independent Software Interface Programs on terms no less favorable than the terms applicable to other participants. Cadence currently has over 100 partners in its Independent Software Interface Programs.

The purpose of these requirements is to ensure that Cadence’s acquisition of CCT’s constraint-driven, shape-based integrated circuit routing tool does not create incentives for Cadence to prevent competing suppliers of constraint-driven, shape-based integrated circuit routing tools from participating in Cadence’s Independent Software Interface Programs; to prevent a need for dual-level entry in the markets for constraint-driven, shape-based integrated circuit routing tools and integrated circuit layout environments; to ensure that independent software developers will continue to invest the resources necessary to develop and sell constraint-



driven, shape-based integrated circuit routing tools that would compete with CCT's constraint-driven, shape-based integrated circuit routing tool; and to remedy the lessening of competition as alleged in the Commission's complaint.

In addition, the proposed Order would prohibit Cadence from acquiring certain interests in any other concern which, within the year preceding such acquisition, engaged in the development or sale of integrated circuit routing tools in the United States, and also would prohibit Cadence from acquiring any assets used or previously used (and still suitable for use) in the development or sale of integrated circuit routing tools in the United States, without prior notice to the Commission, for a period of ten (10) years. Absent this prior notice requirement, Cadence might be able to undermine the purposes of the proposed Order by acquiring a developer of integrated circuit routing tools without the Commission's knowledge, where such acquisition would not be subject to the reporting requirements of the Hart-Scott-Rodino Antitrust Improvements Act of 1976.

Cadence and the Commission also have entered into an Interim Agreement whereby Cadence has agreed to be bound by the terms of the proposed Order, pending and until the Commission's issuance of the proposed Order.

The purpose of this analysis is to facilitate public comment on the proposed Order. This analysis is not intended to constitute an official interpretation of the Agreement or the proposed Order or in any way to modify the terms of the Agreement or the proposed Order.

**Statement of Chairman Robert Pitofsky and  
Commissioners Janet D. Steiger and Christine A. Varney  
in the Matter of  
Cadence Design Systems, Inc./ Cooper & Chyan Technology, Inc.  
File No. 971-0033**

The consent agreement negotiated in this matter, which the Commission has today accepted and placed on the public record for comment, eases competitive concerns raised by Cadence Design Systems, Inc.'s ("Cadence") acquisition of Cooper & Chyan Technology, Inc. ("CCT").

The Commission's complaint alleges that Cadence is the dominant supplier of complete software "layout environments" for the physical design of integrated circuits, or "chips," the postage-stamp sized electronic components used in devices as diverse as personal computers and kitchen appliances. CCT sells a software tool, called a "router," that works within a layout environment and allows users to plot the connections among the millions of components within an integrated circuit. The proposed complaint alleges that CCT is the only firm to have developed a "constraint-driven, shape-based" router, state-of-the-art technology that is expected to solve the next generation of problems that will face integrated circuit producers designing ever more powerful chips.

The Commission's proposed complaint alleges a well-established vertical theory of competitive harm, laid out in the 1984 Merger Guidelines.<sup>1</sup> The Guidelines explain that a vertical merger can produce horizontal anticompetitive effects by making competitive entry less

---

<sup>1</sup> See U.S. Department of Justice Merger Guidelines, 4 Trade Reg. Rep. (CCH) ¶ 13,103 (June 14, 1984) (hereinafter "1984 Merger Guidelines"). When the agencies issued the 1992 Horizontal Merger Guidelines, U.S. Department of Justice and Federal Trade Commission Horizontal Merger Guidelines, 4 Trade Reg. Rep. (CCH) ¶ 13,104 (April 7, 1992), they explained that "[s]pecific guidance on non-horizontal mergers is provided in . . . [the] 1984 Merger Guidelines." U.S. Department of Justice and Federal Trade Commission Statement Accompanying Release of Revised Merger Guidelines, 4 Trade Reg. Rep. (CCH) ¶ 13,104 (April 2, 1992). See generally Herbert Hovenkamp, Federal Antitrust Policy §§ 9.4, 9.5 (1994) (suggesting that vertical mergers may create barriers to entry when one of the parties is a monopolist or near-monopolist).

likely if (1) as a result of the merger, there is a need for simultaneous entry into two or more markets and (2) such simultaneous entry would make entry into the single market less likely to occur.<sup>2</sup> While the dissenting Commissioners may take issue with the “dual-level entry” theory of vertical mergers that the 1984 Guidelines articulate, the available evidence suggests that the Cadence/CCT merger, which combines Cadence’s dominant position in integrated circuit layout environments with CCT’s current monopolistic position in constraint-driven, shape-based integrated circuit routers, presents a straightforward case of anticompetitive effects caused by vertical integration. We believe that this type of competitive harm merits our attention.<sup>3</sup>

When considering the effects of mergers in dynamic, innovative high-tech markets, such as those present here, it is particularly important to investigate whether such mergers will create barriers to entry. New entrants often bring innovation to the market, and the threat of entry leads incumbents to innovate. Therefore, we must be vigilant to preserve opportunities for entry.

As the Analysis to Aid Public Comment explains, unless a would-be supplier of routing tools had the ability to develop an interface to the Cadence integrated circuit layout environment, it would not be able to market its routing product effectively to the vast majority of potential customers which use the Cadence layout environment.<sup>4</sup> Without an expectation that it could design software compatible with Cadence’s installed base, a would-be entrant might well decide not to compete.<sup>5</sup>

---

<sup>2</sup> See 1984 Merger Guidelines § 4.21.

<sup>3</sup> Contrary to Commissioner Starek’s assertions that enforcement action here, in the context of a merger, leads logically to enforcement action against internal vertical expansion, see Dissenting Statement of Commissioner Roscoe B. Starek III at n.8 & accompanying text, such unilateral action has been known to present a completely different set of questions under the antitrust laws for more than one hundred years.

<sup>4</sup> Not only is Cadence the dominant layout environment, but its competitors are in a state disarray. For example, Cadence’s most significant competitor, Avant! Corporation, and several of its top executives have recently been charged with theft of trade secrets from Cadence.

<sup>5</sup> CCT decided that it was so important to gain access to Cadence’s layout environment that when Cadence refused to allow the IC Craftsman product (CCT’s constraint-driven, shape-based router technology) to interface with the Cadence layout program through the “Connections” Program, CCT induced a third party that was a Connections partner to write an interface to the Connections Program for IC Craftsman without Cadence’s knowledge. Cadence thereafter sought to impede CCT’s attempts to gain access to the Cadence integrated circuit layout

After the proposed Cadence/CCT merger, Cadence would have an incentive to impede attempts by companies developing routing technology competitive with CCT's constraint-driven, shape-based router technology, IC Craftsman, to gain access to the Cadence integrated circuit layout environment. Following the proposed merger, successful entry into the routing tool market is more likely to require simultaneous entry into the market for integrated circuit layout environments. Without a consent that mandates access to Cadence's layout environment, and thus lowers the barriers to entry in the market, a combined Cadence/CCT will face less competitive pressure to innovate or to price aggressively. Thus, competition would likely be reduced as a result of the proposed acquisition.

The proposed remedy in this matter preserves opportunities for new entrants with integrated circuit routers competitive with IC Craftsman by allowing them to interface with Cadence's layout environments on the same terms as developers of complementary design tools.<sup>6</sup> Specifically, the proposed order would require Cadence to allow independent commercial router developers to build interfaces between their design tools and the Cadence layout environment through Cadence's "Connections Program." The Connections Program is in place now and has more than one hundred participants who have all entered a standard form contract with Cadence.

The separate statements by Commissioners Azcuenaga and Starek question this enforcement action. We respectfully disagree.

First, Commissioner Azcuenaga argues that the Commission should have brought an action based upon a horizontal theory of competitive harm. We certainly agree that horizontal competitive concerns deserve our close attention and recognize that horizontal remedies often cure vertical problems. If we had credible support for the theory that the proposed merger would

---

environment by suing CCT.

<sup>6</sup> At the same time, the proposed order preserves any efficiencies of vertical integration resulting from the proposed merger, which may benefit customers.

combine actual or potential horizontal competitors and would substantially lessen competition in an integrated circuit routing market or an innovation market for integrated circuit routers, we would not hesitate to advance that case. But after a thorough investigation by Commission staff, we have not found sufficient evidence to conclude that, absent the acquisition, Cadence would have been able to enter the market for constraint-driven, shape-based integrated circuit routers successfully in the foreseeable future.

The dissenting statements fail to give full weight to all the incentives at work in the vertical case. It is true that Cadence would be motivated by the entry of new, promising routing technology to allow an interface to its layout environment to sell more of its *complementary* products. And absent the merger, that would be its only incentive. But with the merger, Cadence clearly also has an incentive to prevent loss of sales in its *competing* products. And while these two incentives may compete as a theoretical matter, the evidence in this case indicates that Cadence has acted historically according to the latter incentive. There is some reason to believe that Cadence in the past has thwarted attempts by firms offering potentially competitive technology to develop interfaces to its layout environment (including at one point, CCT). Now that it has a satisfactory router to offer its customers, there is no reason to think that absent the consent, Cadence would treat developers of routers that would compete with IC Craftsman any differently than it once treated CCT.

Commissioner Azcuenaga also suggests that the consent order is unnecessary because a company developing a router to compete with IC Craftsman could proceed, as CCT did, without an interface to Cadence's design layout environment. The evidence shows, however, that CCT's management thought that ensuring compatibility with Cadence's layout environment was critical and that marketing without that compatibility, which it had done, was not sufficient.<sup>7</sup> It took the extreme measure of inducing a third party to write software for CCT to interface IC Craftsman

---

<sup>7</sup> Interfacing with another firm's design layout environment is also not a feasible alternative because of Cadence's dominant position in the market. Without hope of marketing to the vast majority of customers, developers of an alternative router have minimal incentives to compete. In addition, the competitive significance of Cadence's few competitors is questionable.

with the Cadence layout environment without Cadence's knowledge. Moreover, despite CCT's success in developing a routing program, its sales were modest before the merger announcement.<sup>8</sup>

Commissioner Azcuenaga is further concerned that mandating access to the Connections Program for developers of routing software on terms as favorable as for other Connections participants might have unintended consequences. In particular, she is concerned that the order may prompt Cadence to charge higher prices to all Connections partners. But the Connections Program is an existing program with over one hundred members, and Cadence would have significant logistical difficulties, and would risk injuring its reputation, if it suddenly altered the terms of the program. Also, Cadence has good reasons for having so many Connections partners—they offer Cadence customers valuable tools, most of which do not compete with Cadence products. It seems unlikely that Cadence would be motivated to make the Connections Program less appealing to those partners.

Both Commissioners Azcuenaga and Starek suggest that the proposed remedy may be difficult to enforce. Any time this Commission enters an order, it takes upon itself the burden of enforcing the order, which requires use of our scarce resources. However, we think the proposed order, which simply requires Cadence to allow competitors and potential competitors developing routing technology to participate in independent software interface programs on terms no less favorable than the terms applicable to any other participants in such programs, is a workable approach.<sup>9</sup> Connections partners all sign the same standard-form contract and there has been a consistent pattern of conduct with respect to the program to use as a baseline for future comparisons. Moreover, the Commission has had experience with such non-discrimination provisions, and can rely on respondent's compliance reports required under the order as well as

---

<sup>8</sup> Products offering incremental innovation rather than the revolutionary breakthrough of IC Craftsman would have an even more difficult time entering.

<sup>9</sup> The language of the consent is clear in requiring that terms for routing companies be no less favorable than for any other participant in the Connections Program. Thus, we do not understand Commissioner Starek's conclusion that the consent could be interpreted to require routing companies to pay a "fee no higher than the highest fee." And as his own dissent acknowledges, if the order could be interpreted to allow Cadence to terminate router developers from the Connections Program after thirty days, the proposed order would be meaningless.

complaints from independent software developers to ensure compliance with the consent. We think the dissenting Commissioners' scenarios about intractable compliance issues are unfounded.

In sum, we believe that the consent order will preserve competition in the market for cutting-edge router technology by reducing barriers to entry.

**Statement of Commissioner Mary L. Azcuenaga**  
**Concurring in Part and Dissenting in Part**  
in Cadence Design Systems, Inc., File No. 971-0033

The acquisition of Cooper & Chyan Technology, Inc. (Cooper & Chyan), by Cadence Design Systems, Inc. (Cadence), combines the only firm currently marketing a constraint-driven, shape-based integrated circuit routing tool with a firm that was, at least until the acquisition, on the verge of entry into this market. I find reason to believe that the proposed merger would violate Section 7 of the Clayton Act under a horizontal, potential competition theory of law. I dissent from the complaint because it fails to allege a horizontal violation of law and because I do not find reason to believe that the transaction would violate the law under the vertical theory that is alleged in the complaint. I support the part of the order that addresses the horizontal problem, although I question whether it is sufficient. The classic horizontal remedy would be divestiture of either the Cooper & Chyan routing tool or the Cadence routing tool that has not yet reached the market. I do not support the rest of the order.

Despite the absence of a horizontal allegation in the complaint, the majority nevertheless has addressed the horizontal competition issue in paragraph III of the proposed consent order, which imposes a ten-year prior notice provision. Under the Commission's policy, prior notification provisions are imposed to prevent a recurrence of an anticompetitive merger.<sup>1</sup> This prior notice provision seems to address the prospect of another anticompetitive, horizontal merger in the market for "Integrated Circuit Routing Tools." Any further acquisition by Cadence of a firm marketing such a tool would present obvious horizontal issues, but should not require any additional vertical cure. To the extent that this proposed order provides a vertical remedy

---

<sup>1</sup> According to the "Statement of Federal Trade Commission Policy Concerning Prior Approval and Prior Notice Provisions" (June 21, 1995), the Commission imposes such prior notice requirements only on a finding of "credible risk that a company that engaged or attempted to engage in an anticompetitive merger would, but for an order, engage in an otherwise unreportable anticompetitive merger."



for any possible market foreclosure or increased barriers to entry, a duplicate vertical order against Cadence would be unnecessary.

Paragraph II of the proposed order requires Cadence to allow developers of "Commercial Integrated Circuit Routing Tools" to participate in its connections program on "terms no less favorable than" the terms offered to any other participant. According to the Analysis to Aid Public Comment at page 7, this provision is intended to eliminate the need for dual level entry so that a future developer of "Commercial Integrated Circuit Routing Tools" will not also need to develop an environment comparable to Cadence's environment.

I question this aspect of the case for several reasons.<sup>2</sup> First, Cooper & Chyan was successful in developing and marketing its routing program before it obtained access to Cadence's environment program. This success suggests that access to Cadence's environment is not necessary to the success of an entrant in the routing tool market. Second, although Cadence initially denied Cooper & Chyan access to its connections program, it reversed course and granted the access. To the extent that Cadence may have capitulated to pressure from customers to grant access, that capitulation would suggest that Cadence has little or no power to deny access to its connections program to a product that its customers want. Third, this remedy is premised on the allegation in paragraph 16 of the Complaint that "Cadence does not, however, have incentives to provide access to a Cadence integrated circuit layout environment to suppliers of integrated circuit layout tools that compete with Cadence products." To the extent that a Section 7 order may be based on incentives, the incentives appear to be at least as likely to go the other way. If another company develops an innovative, advanced router, one would assume that Cadence would have incentives to welcome the innovative product to its suite of

---

<sup>2</sup> The majority is mistaken to the extent they believe I take issue with Section 4 of the U.S. Department of Justice Merger Guidelines (June 14, 1984). See Statement of Chairman Robert Pitofsky and Commissioners Janet D. Steiger and Christine A. Varney written in response to this statement and the dissenting statement of Commissioner Starek.

connected design tools, thereby enhancing the suite's utility to customers.

Paragraph II of the proposed order may be counterproductive and may result in substantial enforcement costs for the Commission. Because Paragraph II bars Cadence from charging developers of "Commercial Integrated Circuit Routing Tools" a higher access fee than developers of other design tools, one possible, unintended consequence of the order is that Cadence may reduce or eliminate discounting of access fees. In addition, enforcement of the provision of the order requiring Cadence to provide access to the connections program to developers of "Commercial Integrated Circuit Routing Tools" on terms "no less favorable than the terms applicable to any other participants" may well embroil the Commission in complex commercial disputes.

I concur in the acceptance of Paragraph III of the proposed order and dissent from the acceptance of Paragraph II of the proposed order.

DISSENTING STATEMENT OF COMMISSIONER ROSCOE B. STAREK, III

In the Matter of

*Cadence Design Systems, Inc. and Cooper & Chyan Technology, Inc.*

File No. 971 0033

I respectfully dissent from the Commission's decision to accept a consent agreement with Cadence Design Systems, Inc. ("Cadence"), a supplier of software for the design of integrated circuits ("ICs"). The proposed complaint alleges that the merger of Cadence and Cooper & Chyan Technology, Inc. ("CCT") -- a producer of software complementary to Cadence's -- is likely substantially to lessen competition in violation of Section 7 of the Clayton Act, 15 U.S.C. § 18, and Section 5 of the Federal Trade Commission Act, 15 U.S.C. § 45. To justify the proposed complaint and order, the Commission once again invokes the specter of anticompetitive "foreclosure" as a direct consequence of the transaction. As I have made clear on previous occasions, foreclosures are generally unconvincing as a rationale for antitrust enforcement. The current case provides scant basis for revising this conclusion. <sup>1</sup>

The theory of harm presented here is the same as -- and thus shares all of the defects of -- that offered in *Silicon Graphics, Inc.* ("SGI").<sup>2</sup> In *SGI*, the Commission alleged that the merger of a computer hardware manufacturer (SGI) and two software vendors (Alias and Wavefront) would result in the post-acquisition "foreclosure" of other independent software suppliers, leading to monopoly prices for graphics software. The Commission claimed that because the acquisition would give SGI its own in-house software producers, SGI no longer would allow unaffiliated software vendors access to its hardware platform.

In the current incarnation of this theory, Cadence is cast in the role of SGI and CCT in the role of the software vendors. The Commission alleges that Cadence no longer will allow independent suppliers of "routing" software -- the type of software sold by CCT -- to write programs that can interface with other IC layout programs in the Cadence suite. To mitigate these supposed anticompetitive incentives, the proposed order would require

---

<sup>1</sup> See Dissenting Statement of Commissioner Roscoe B. Starek, III, in *Time Warner Inc., et al.*, Docket No. C-3709 (consent order, Feb. 3, 1997); Dissenting Statement of Commissioner Roscoe B. Starek, III, in *Waterous Company, Inc. and Hale Products, Inc.*, Docket Nos. C-3693 & C-3694 (consent orders, Nov. 22, 1996); Dissenting Statement of Commissioner Roscoe B. Starek, III, in *Silicon Graphics, Inc. (Alias Research, Inc., and Wavefront Technologies, Inc.)*, Docket No. C-3626 (consent order, Nov. 14, 1995); Remarks of Commissioner Roscoe B. Starek, III, "Reinventing Antitrust Enforcement? Antitrust at the FTC in 1995 and Beyond," remarks before a conference on "A New Age of Antitrust Enforcement: Antitrust in 1995" (Marina del Rey, California, Feb. 24, 1995).

<sup>2</sup> *Supra* note 1.

Cadence to provide independent vendors of routing software access to its "Independent Software Interface Programs" ( e.g., to its "Connections Program") on terms "no less favorable" than the terms offered to other independent software vendors.<sup>3</sup>

The logic of the proposed complaint is fundamentally flawed. Even if we assume *arguendo* -- as the proposed complaint in this case does -- that Cadence is "dominant" in the supply of software components complementary to the router,<sup>4</sup> the fact remains that it has no incentive to restrict the supply of routers. I noted in *SGI* that "SGI ha[d] strong incentives to induce expanded supply of SGI-compatible software: increasing the supply of compatible software (or of any complementary product) increases the demand for SGI's workstations."<sup>5</sup> The same is true here: the introduction of a lower-priced or higher-quality routing program increases the value of Cadence's "dominant" position in the sale of software complementary to the router, because it

---

<sup>3</sup> Proposed order, ¶ II.A.

<sup>4</sup> The anticompetitive theory requires Cadence to have substantial monopoly power: if there were numerous good alternatives to Cadence's suite, other independent vendors of routing software could affiliate with them and there would be no "foreclosure."

<sup>5</sup> Dissenting Statement in *SGI*, *supra* note 1, at 2. Moreover, as was also true in *SGI*, the description of the premerger state of competition set forth in the complaint itself tends to exclude the possibility of substantial postmerger foreclosure. In *SGI*, the complaint alleged that software producers other than Alias and Wavefront were competitively insignificant prior to the merger, and that premerger entry barriers were high. Similarly, the current complaint (¶ 11) alleges that there are substantial premerger barriers to entry into the market for the kind of "router" software that CCT produces. But one cannot find *both* that the premerger supply elasticity of substitutable software is virtually zero *and* that the merger would result in the substantial postmerger foreclosure of independent software producers. If entry into constraint-driven, shape-based IC router software is effectively blocked premerger, as the complaint contends, it cannot also be the case that the merger would cause a substantial incremental reduction in entry opportunities.

increases the demand for Cadence design software, thereby allowing Cadence to increase the price and/or the output of these programs. Despite the majority's assertions to the contrary,<sup>6</sup> this is true whether or not Cadence has vertically integrated into the sale of routing software, for efficient entry into the production of routing software increases the joint profits of the entrant and Cadence. If the Commission is correct that Cadence is "dominant" in the supply of software components complementary to routers, then of course Cadence may be in a position to expropriate -- e.g., via royalties paid to Cadence by the entrant for the right to "connect" to Cadence's software -- some or all of the "efficiency rents" that otherwise would accrue to an efficient entrant. This, however, would constitute harm to a competitor, not to competition, and Cadence would have no incentive to set any such rates so high as to preclude entry.

The theory of harm and the remedy proposed here also share many of the flaws that I pointed out in *Time Warner*.<sup>7</sup> In that case the Commission's action was based to a significant degree on the argument that increased vertical integration into cable

---

<sup>6</sup> The majority asserts that "Cadence clearly also has an incentive to prevent loss of sales in its *competing products*." (Majority Statement at 4; emphasis in original.) Similarly, the *Analysis of Proposed Consent Order to Aid Public Comment* simply asserts (at 5) that "Cadence does not . . . have incentives to provide access to its integrated circuit layout environments to suppliers of integrated circuit layout tools that compete with Cadence products." Because neither the majority statement nor the *Analysis to Aid Public Comment* describes how this conclusion was reached, it is difficult to identify precisely the source of the erroneous reasoning. Chiefly, however, it seems to reflect a manifestation of the "sunk cost fallacy," whereby it is argued that because Cadence has now sunk a large sum of money into acquiring CCT, this in and of itself would provide Cadence with an incentive not to deal with independent vendors of complements. This reasoning, of course, is fallacious: the cost incurred by Cadence in acquiring CCT -- whether a large or a small sum -- is irrelevant to profit-maximizing behavior once incurred, for bygones are forever bygones. The introduction of a superior new router, even if by an independent vendor, will increase the joint profits of Cadence and this vendor (irrespective of the amount spent in acquiring CCT), and both parties will have a profit incentive to facilitate its introduction.

Moreover, the majority also imputes a sinister motive to Cadence's reluctance to deal with certain competitors, while failing to acknowledge that this reluctance almost surely represents a legitimate and well-founded interest in protecting its intellectual property. As the *Analysis to Aid Public Comment* notes (at 4): "Cadence's leading competitor in the supply of integrated circuit layout environments, Avant! Corporation, has been charged criminally with conspiracy and theft of trade secrets from Cadence, and several top Avant! executives have been charged criminally as well."

<sup>7</sup> See my Dissenting Statement in *Time Warner Inc., et al.*, *supra* note 1.

programming on the part of Time Warner and Tele-Communications, Inc. would increase those firms' incentives to reduce the supply of independently produced television programming. Carried to its logical conclusion, this theory of harm constitutes a basis for challenging any vertical integration by large cable operators or large programmers -- even vertical integration occurring via *de novo* entry by a cable operator into the programming market or *de novo* entry by a programmer into distribution.

Now apply this train of thought to the current matter. Contrary to the analysis presented above, suppose that somehow Cadence could profit anticompetitively from denying interconnection rights to independent router vendors. If that were so, then it would not be sufficient merely to prevent Cadence from acquiring producers of complementary software. Rather, the Commission would have to take the further step of *preventing Cadence from developing its own routers*; for under the anticompetitive theory advanced in the complaint, any vertical integration by Cadence into routers, *whether accomplished by acquisition or through internal expansion*, would engender equivalent post-integration incentives to "foreclose" independent

vendors of routing software. <sup>8</sup> Of course, as I noted in *Time Warner*, there is likely to be little enthusiasm for such a policy because there is a general predisposition to regard internal capacity expansion as procompetitive. <sup>9</sup>

Not only am I unpersuaded that Cadence's acquisition of CCT is likely to reduce competition in any relevant market, but -- as in *SGI* and *Time Warner* -- I would find the proposed order unacceptable even were I convinced as to liability. As in *Time Warner*, the Commission seeks to impose a "most favored nations" clause that would require Cadence to allow all independent router developers to participate in its software interface programs on terms that are "no less favorable than the terms applicable to any other participants in" those interface programs. Even apart from the usual problems with "most favored nations" clauses in

---

<sup>8</sup> Thus, it is unclear how the Commission should respond, under the logic of its complaint, were Cadence to introduce an internally developed software program (now provided by one or more independent vendors) that is complementary to its "dominant" suite of programs. Obviously Cadence would be in a position (similar to that alleged in the Commission's complaint) to block access to the Cadence design software if it wanted to. Even if Cadence did not terminate the independent vendors, consistent application of the economic logic of the present complaint seemingly would require the Commission to seek a prophylactic "open access" order against Cadence similar to the order sought here. This enforcement policy would of course have a number of adverse competitive consequences, including deterrence of Cadence from efficiently entering complementary software lines through internal expansion.

The observation in note 3 of the majority statement that antitrust law has treated vertical integration by merger differently from internal vertical integration "for more than one hundred years" suggests that I do not recognize that the law provides for differential treatment of mergers and internal expansion. I simply intended to point out the illogicality of finding vertical integration *with identical economic consequences* to be illegal under the Commission's standards of merger review, when that integration would be of no concern (and might even be applauded) if it resulted from simple internal expansion.

<sup>9</sup> In the present case, as in *Time Warner*, the Commission has alleged the existence of substantial pre-acquisition market power in both vertically related markets (routing software and the rest of the IC layout "suite" here, see complaint ¶¶ 9-11, and cable television programming and distribution in *Time Warner*). Under these circumstances, there is a straightforward reason why vertical integration is both profitable and procompetitive (i.e., likely to result in lower prices to consumers): vertical integration would yield only one monopoly markup by the integrated firm, rather than separate markups (as in the pre-integration situation) by Cadence and CCT.

consent orders,<sup>10</sup> this order -- as in both *SGI* and *Time Warner* -- will require that the Commission continuously regulate the prices and other conditions of access.

Indeed, compared to the proposed order in the present case, the order in *Time Warner* was a model of clarity and enforceability. What does it mean to mandate treatment "no less favorable than" that granted to others, when Cadence's current Connections Program -- with well over 100 participants -- allows access prices to differ substantially across participants and imposes substantial restrictions on the breadth and scope of the

---

<sup>10</sup> As I noted in *Time Warner*, these clauses have the capacity to cause all prices to rise rather than to fall. Dissenting Statement, *supra* note 1, at 20. The majority (at 5) seems comfortable with this outcome, provided that all vendors pay the same price.



permitted connection rights? <sup>11</sup> Does it mean that router vendors pay a connection fee no higher than the highest fee paid by an existing participant? Or would they pay a fee no higher than the current lowest fee? Or does it mean something else? Router vendors surely will argue for the second interpretation -- a view also apparently shared by the Commission majority <sup>12</sup> -- yet there is no obvious reason why router vendors should be entitled to such a Commission-mandated preferential pricing arrangement, and neither the majority nor the *Analysis to Aid Public Comment* has offered one.

Similarly, does the "no less favorable" requirement mandate that the vendors of routing software obtain access rights as broad as the broadest rights now granted, or simply no worse than the narrowest now granted? And since the current Connections contracts are terminable at will by either party with 30 days' notice, does "no less favorable" mean only that router vendors must be given the same termination terms as other software vendors, or does it mean something else ( e.g., termination only for cause, where the "reasonableness" of the termination is subject to *ex post* evaluation by the Commission)? <sup>13</sup> The former interpretation of the order seems the most straightforward; however, it is also one that essentially would nullify the protection of independent router vendors and thus would render the order meaningless. <sup>14</sup>

The preceding suggests strongly that the real (albeit unstated) goal of the order is not to nullify any actual anticompetitive effects from the proposed transaction, but rather to invalidate the principal aspects of Cadence's "Connections Program" ( i.e., the ability to charge different connection fees and to terminate vendors at will) without demonstrating that the program's provisions violate the law. There is little reason to believe that this program is harmful to competition, and there are strong efficiency reasons for allowing Cadence to set different fees for different vendors. Moreover, setting a

---

<sup>11</sup> For example, CCT had been permitted to participate in the Connections Program with its printed circuit board router but not with its IC router.

<sup>12</sup> See Majority Statement at note 9.

<sup>13</sup> Moreover, does the terminability of the Connections contract on 30 days' notice mean that the "no less favorable" requirement might need to be reviewed every 30 days?

<sup>14</sup> The majority implies (Majority Statement at note 9) that the exercise of this right would indeed constitute a violation of the order.

uniform fee would result in price increases to at least some vendors.

Because I do not accept the majority's theory of liability in this case, and because I find the proposed remedy at best unenforceable and at worst competitively harmful, I dissent.