CO-LaN: CAPE-OPEN Laboratories Network
Delivering the power of open standard interfaces and component software in Computer-Aided Process Engineering
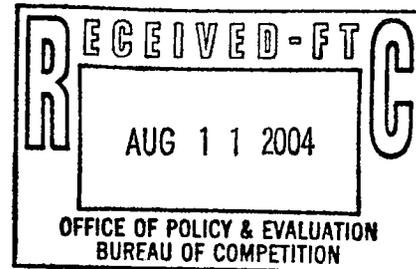*Association loi de 1901 créée le 8 Février 2001*

CO ▼ LaN

August 9, 2004

To: Federal Trade Commission
Office of Policy and Evaluation
Room 394
600 Pennsylvania Avenue, N.W.
Washington, DC 20580
United States of America

Re: FTC Docket 9310 - Proposed Consent Order Announced July 15, 2004

Dear Sirs and Madams,

The CAPE-OPEN Laboratories Network (acronym CO-LaN) is a non-for-profit organization set up to manage, enhance, disseminate, and support the CAPE-OPEN standards. Its members are organizations using process simulation flowsheet software, vendors of such software or academic institutions active in research in computed-aided process engineering (CAPE) (see www.colan.org website for bylaws, membership list and documents pertaining to the CAPE-OPEN standards).

Pursuant to the Federal Trade Commission's publication of a proposed consent agreement in the above referenced matter, the CAPE-OPEN Laboratories Network appreciates the opportunity to comment.

CO-LaN will address questions related to the CAPE-OPEN standards in these comments. Comment 1 proposes a minor modification for the standards-setting organization name. Comment 2 addresses the list of CAPE-OPEN specifications to be supported by mentioned software products. Comment 3 proposes a way to check CAPE-OPEN compliance.

Comment 1

In section I (« ORDER ») of the FTC Proposed Consent Order, paragraph I, the standard setting organization mentioned should be mentioned as the CAPE-OPEN Laboratories Network (acronym CO-LaN) instead of CAPE-OPEN. Co-LaN is the recognized organization promoting, supporting the CAPE-OPEN standards with AspenTech as an Associate Member together with many other

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software vendors. CO-LaN will welcome as an Associate Member the organization buying HYSYS Engineering Software from AspenTech.

Comment 2

In section IV of the FTC Proposed Consent Order, CO-LaN welcomes the orders concerning the implementation and support of CAPE-OPEN standards.

AspenTech should upgrade HYSYS products to CAPE-OPEN Thermodynamics and Physical Properties interface specification version 1.1 rather than provide support for this enhanced version of the CAPE-OPEN standards. The implementation of this part of the CAPE-OPEN standards should also be made by AspenTech for AspenTech heritage products in order to reach the interoperability level sought by the end-users.

Regarding the part of the CAPE-OPEN standards pertaining to numerics and chemical reactions, CO-LaN welcomes the support of these. However the part of the CAPE-OPEN standards on numerical services involves a number of related but different interface specifications that could be mentioned.

The Numerical Solvers interface specification (please take note of this precise description) is contained in document CO-NUMR-EL-03 Version 1.08 that is part of the version 1.0 CAPE-OEPN documentation set. This specification focuses on the solution algorithms that are necessary for carrying out steady state and dynamic simulation of lumped systems. In particular, this includes algorithms for the solution of large, sparse systems of non-linear algebraic equations (NLAEs) and mixed (ordinary) differential and algebraic equations (DAEs). Algorithms for the solution of the large sparse systems of linear algebraic equations (LAEs) that often arise as sub-problems in the solution of NLAEs and DAEs are also considered. This part of the CAPE-OPEN standards introduces new concepts, such as models and the equation set object (ESO), which is a software abstraction of a set of non-linear algebraic or mixed (ordinary) differential and algebraic equations.

Implementation of this part of the CAPE-OPEN standards in both AspenTech and Hyprotech heritage products will permit the use of third-party numerical solvers in both lines of products.

The interface specification on Numerical Solvers is only one of the CAPE-OPEN interface specifications related to numerical services. The Partial Differential Algebraic Equations interface as well as the Optimisation interface is also related to numerical services.

The Partial Differential Algebraic Equations interface (version 4) is part of version 1.0 of the CAPE-OPEN standards documentation as distributed on the CO-LaN website. This interface defines, on top of the Numerical Solvers specification, numerical services for systems with some variables distributed along one or several dimensions. Within partial differential algebraic equation systems the dependent model variables depend on one or more independent variables. Independent variables are for instance spatial co-ordinates, particulate co-ordinates (in case of population balance models) or time (in case of dynamic models). Thus, models of computational fluid dynamics are also included in this class of problems.

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The Optimisation interface (version 2) is also part of version 1.0 of the CAPE-OPEN standards documentation as distributed on the CO-LaN website. The Optimisation interfaces define access to Mathematical Programming optimisation services. These interfaces are also based on the Solvers interface architecture. Mathematical programming (IP / LP / NLP / MILP / MINLP) problems involve the minimisation or maximisation of a linear / nonlinear objective function subject to linear / nonlinear constraints. The optimisation may involve both continuous and discrete (integer-valued) decision variables. Mathematical programming optimisation problems arise in many process engineering applications, including process synthesis, process design, product design and others.

Regarding the Chemical Reactions interface (please take note of this precise description), CO-LaN thinks that as for the above mentioned Numerical Solvers part of the CAPE-OPEN standards, implementation in both AspenTech and Hyprotech heritage products is desirable.

Also the broader scope of the thermodynamic part of the CAPE-OPEN standards should be addressed. Regarding the Chemical Reactions interface specification, its part on Electrolytes is of major interest to many end-users as well as its extension to Petroleum Fractions that forms a separate specification document. Also a related part of the CAPE-OPEN standards is the one on Physical Properties Data Bases that is specifically needed to easily plug in process simulation software such well known data bases as the ones provided by the Design Institute for Physical Properties (DIPPR from American Institute of Chemical Engineers) or by DECHEMA This will provide the full scope of information embedded in these databanks rather than the limited set of information that is currently available via proprietary interfacing.

To be noted, AspenTech and Hyprotech heritage products are using COM/DCOM middleware in their interfacing with other applications. So compliance to CAPE-OPEN standards should be primarily with COM/DCOM versions of the CAPE-OPEN standards as published on the CO-LaN website.

Comment 3

CO-LaN is available to check the CAPE-OPEN compliance requested by FTC. This compliance is typically checked through the use of dedicated software developed by CO-LaN or through interoperability tests with third-party software. A Special Interest Group within CO-LaN supervises interoperability tests and a number of these have been conducted by CO-LaN members over the last two years. The development of CAPE-OPEN Testers has represented a huge investment of the CO-LaN over the last two years and CO-LaN is committed to progress on these testers.

If you need more information, please feel free to call Werner Merk at +49 4146 913580 or Michel Pons at +33 4 72 39 65 95.

Sincerely

Werner MERK
President of CO-LaN and on behalf of the "Full Members" of CO-LaN