

Structural Analysis and Design Software

ne-of-a-kind Langley Research Center computer code for designing exotic hypersonic aircraft was transferred to a private company for more pedestrian use in ground transportation, building construction and marine industries.

Working through the Technology Applications Group at the NASA center, the Collier Research and Development (R&D) Corporation of Hampton, Virginia received the first ever Langley software copyright license agreement. The agreement was signed in May 1996.

Collier R&D transformed the NASA computer code into a commercial software package called HyperSizer[™]. The commercial software package integrates with other popular Finite Element Modeling (FEM) and Finite Element Analysis (FEA) private-sector structural analysis and design packages.

The Langley and Collier R&D agreement is viewed as a pioneering step for government transfer of technology to U.S. industry. Collier R&D will pay NASA royalties from software sales.

"For NASA, it represents the emerging recognition of the value of computer software as a potentially licensable technology. The software intellectual property rights were treated similarly to hardware patent rights," says Collier R&D's Ivonne Collier, president of the company.

"For Collier R&D, the agreement represents a broadening of its business from engineering consulting to developers and marketers of software technology," says the company president.

ØIHTINCODE	_[[] ×]	Barbertonia Mension Americani	SUProject D1 Educed Panel From	A Sections		
E-INTRCODE database 'C:\ST-SIZE\pickenheim\tree4\Mai		SUPERIOR SCHOOL	will next create new sec			
⇒ Definitions and Materials → Orthotropic Materials (1-959) ⊕ Polymer composite (1-459) ⊕ Metal Matrix Composite (600-559) ⊕ Ceramic Composite (600-559)		film next creste new				
		component TICrigs Sistpanel in the first project 1 New Studtual Component discription				
				panel/beam family	Craigs first panel in the first project	
				Other (700-999)	Provide State of the second state	and the second se
		Composite Layups (1000-1999) Composite Laminates (2000-2999 maxia) Stotropic Materials (3000-4999) Composite Laminates (2000-4999) Composite Laminates (2000-		Teoreopanes 111	Dimensional Configuration picture Segment 1 Segment 2 Segment 3	
description						
Aluminum (3000-3499)	3008 5555	New Structural Component	intraic	200 - 200 E		
	name	- Internet and the second second		1000		
+ Steel (4000-4499)	5555	[factors]	materialt 2009 5555	lanos		
+ Other (4500-4999)	description [hithi	_ strength checksI	2028 Material Twelve 33	1.12		
E Sizing Projects	in the second se	IX taminal a barra	3523 Material 123			
Eurn1						
States of the second	Temperature Qualifiert	R maxiban		1 10 1 2 - (S) (SECU		
	hermal	L R taihā stain	2.22	materials		
	and the second second	FR ply basic	1	1 ONE 5 THREE		
	in the second second	R max shess	anvinactickness pieces	666 THREE		
	eal conductivity (B	-D.L. Plans in The Local Division of the Loc	0.00 0.00 4 -	687 THREE		
	and capacity (BTU	and the second s	These terms the T	A state of the second second		
	par capacity (arto	State of the second	STATISTICS IN THE STATE OF	denilae realin		
	der 1 E	01 EUNIX 0 577 821				
	and the second second	and the second	Frank Parks	(China Mathema		
			Street of States	and the second sec		
			A MARY SAME LESS			
		In Continue of Continue of	The state of the			
(95)	1000	MISSESTIANS.		La		
ection Characteratics	and the second s	THE STATES OF				
Numer of Sections: Max Unit Weight	UZXIII I I I I I I I I I I I I I I I I I			and the second s		
	STUDE NELLS		States and the states of the s	and the second second		
160 8.22	STATE DALL					
and the second		re button to drag, right to zoom,				
Start L. VRives Viewer - IFEH will bo Corel WordPede		It's Form1	Tarin an	a at man a		

The NASA software, called ST-SIZE, was chiefly conceived as a means to improve and speed the structural design of a future aerospace plane for Langley's Hypersonic Vehicles Office. Different classes of materials under consideration for use on a hypersonic plane could be computer modeled, then shown how they would react under extreme temperature changes, speeds, pressures and other operating conditions. The software tool gave structural engineers the confidence to select the proper lightweight materials for use in high-speed aircraft.

Including the NASA computer code into the HyperSizer software package has equipped Collier R&D to look beyond aerospace to other high-tech applications. These include improved design and construction for offices, marine structures, cargo containers, commercial and military aircraft, rail cars and a host of everyday consumer products.

HyperSizer can evaluate and optimize:

- any cross sectional shapes, sizes, thicknesses, materials selections, and material layups;
- many composite material types such as polymer, ceramic, metal matrix, as well as concrete, wood, steel, and aluminum alloys;
- thermal stress problems caused by thermal gradients from aerodynamic heating and/or cryogenic fuels; and
- weight estimations and structural integrity. Failure mode checks performed with HyperSizer can recognize potential structural deficiencies of any component early in the project's design phase.

Previously an engineering consulting organization, the addition of HyperSizer has enhanced the Collier R&D Corporation portfolio of services and products, while strengthening its competitive posture within the software industry.

[™] HyperSizer is a trademark of Collier Research and Development Corporation.

Collier R&D's HyperSizer software, developed from NASA technology, displays an aircraft's surface in multicolored pixels.