National Aeronautics and Space Administration

Office of Small Business Mentor-Protégé Program

Historically Black Colleges and Universities TECHNOLOGY INFUSION ROAD TOUR and Minority-Serving Institutions

www.nasa.gov

Virginia State University

Office of Small Business Mentor-Protégé Program

Virginia State University
College of Engineering & Technology
Talent Pipeline

VSU VIRGINIA STATE

Office of Small Business Mentor-Protégé Program

- **Total enrollment 5,000**
- ***U.S. News & World Report* twice acknowledged VSU as the top, public, master's level HBCU in America. We are one of Virginia's two lands grant institutions.**
- **236-acre main campus, with more than 50 buildings, including 16 dormitories and 17 classroom buildings, and a 416-acre agricultural research facility.**

VSU Virginia State

College of Engineering & Technology

Dept. of Mathematics & Economics

- **Economics**
  BS & MS
  (65 majors)
- **Mathematics**
  BS & MS
  (75 majors)

College of Engineering & Technology

Dept. of Engineering & Computer Sciences

- Computer Engineering (135 majors)
- Manufacturing Engineering (60 majors)
- Computer Sciences BS & MS (150 majors)

Dept. of Technology

- Mech. Engr. Tech (100 majors)
- Electronics Engr. Tech (70 majors)
- Information Logistics Tech (60)

Office of Small Business Mentor-Protégé Program

College of Engineering & Technology

Core Competencies:

a. Unmanned and Autonomous Technology
b. Sensor Networks/ Cyber Security
c. Friction Stir Welding
d. Machine Learning & Inference Algorithms
e. Big Data Analytics & ERP Systems
f. Game Theory and System Optimization

SAP | University Alliances

CCALS Commonwealth Center for Advanced Logistics Systems

CCAM COMMONWEALTH CENTER FOR ADVANCED MANUFACTURING

VSU VIRGINIA STATE

A New Model for Collaboration

Office of Small Business Mentor-Protégé Program

CCAM
COMMONWEALTH CENTER FOR ADVANCED MANUFACTURING

CCALS
Commonwealth Center for Advanced Logistics Systems

Founded in May 2010

Founded in December 2012

Key Attributes of CCAM and CCALS

- Industry-driven
- Multiple Universities
- Global Corporations
- Government Members
- Translational Research
- Workforce Development
- Enabler of Federal Funding
- Focus in Major Economic Sectors for Virginia

Public-Private Partnership

VSU VIRGINIA STATE

CCAM Membership

Office of Small Business Mentor-Protégé Program

AEROJET ROCKETDYNE

AIRBUS

Canon
CANON VIRGINIA, INC.

CHROMALLOY

Newport News Shipbuilding
A Division of Huntington Ingalls Industries

oerlikon metco

Rolls-Royce

SANDVIK Coromant

SIEMENS

OLD DOMINION UNIVERSITY
IDEA FUSION

UNIVERSITY of VIRGINIA

VSU VIRGINIA STATE

VirginiaTech
Invent the Future

NASA

Blaser. SWISSLUBE

eos e-Manufacturing Solutions

CHERMLE Machine Company

Mitutoyo

Paradigm Precision
a DPG company

BUEHLER
An ITW Company

COOL CLEAN TECHNOLOGIES

+GF+

AgieCharmilles

NATIONAL INSTRUMENTS

Mechdyne
ENABLING DISCOVERY

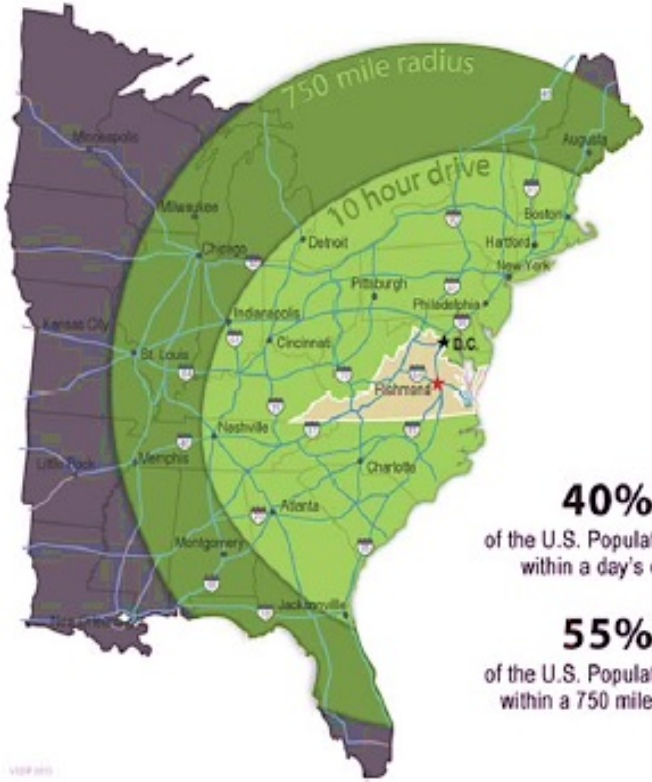
SIS

Why VSU's focus on Logistics?

Office of Small Business Mentor-Protégé Program

Virginia is a hub of logistics

- Port of Virginia (POV)
- Interstates 95, 85, 64
- Commercial Airports
- Pentagon, Ft Belvoir, Ft Lee



40%
of the U.S. Population lives within a day's drive

55%
of the U.S. Population lives within a 750 mile radius

ORBIS

LMR
Proven Partners for Success

VSU
VIRGINIA STATE

SUPPORT STARTS HERE

THE PORT OF VIRGINIA

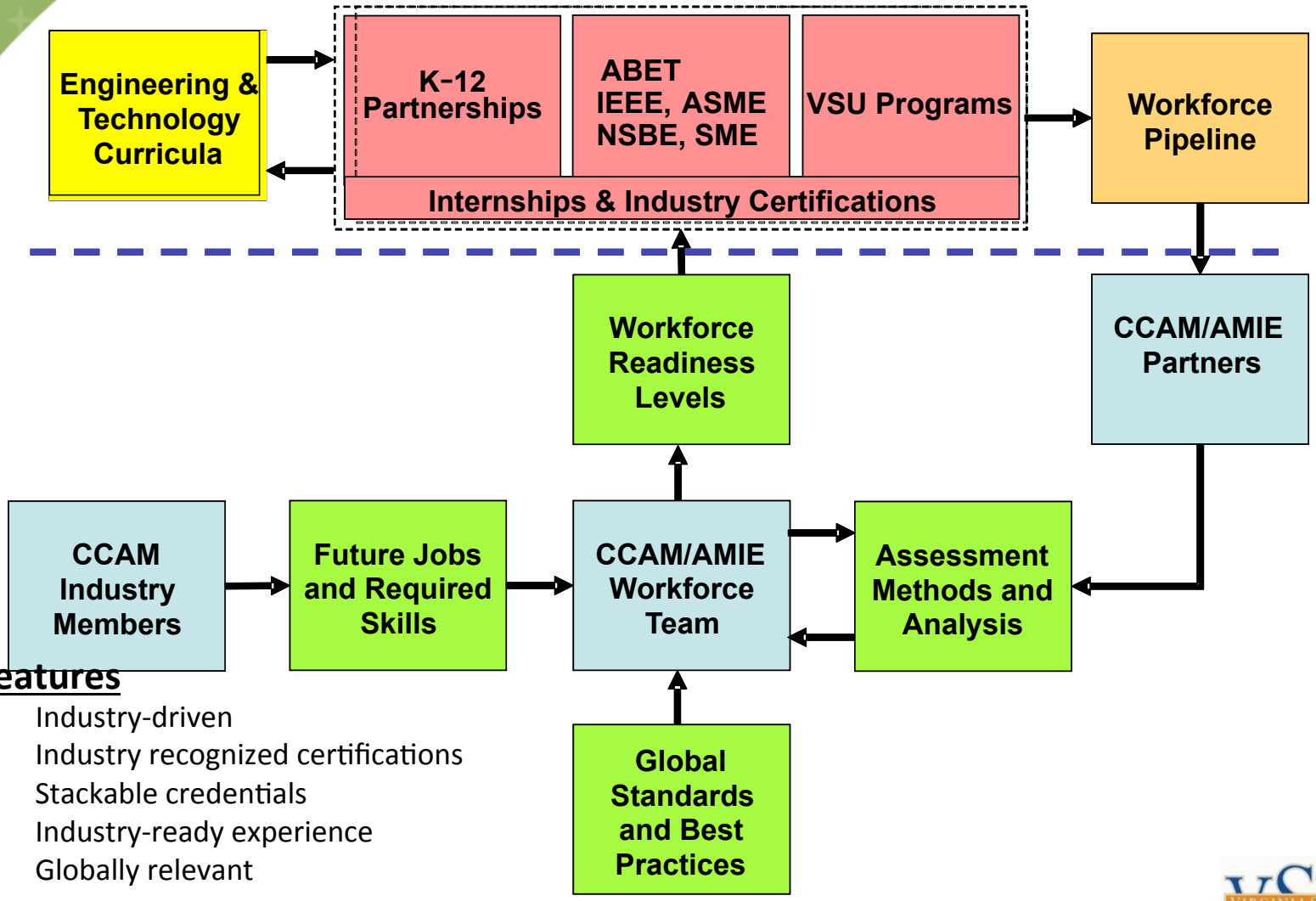
UNIVERSITY of VIRGINIA

LONGWOOD UNIVERSITY

CCALS
Commonwealth Center for Advanced Logistics Systems

VCU
VIRGINIA COMMONWEALTH UNIVERSITY

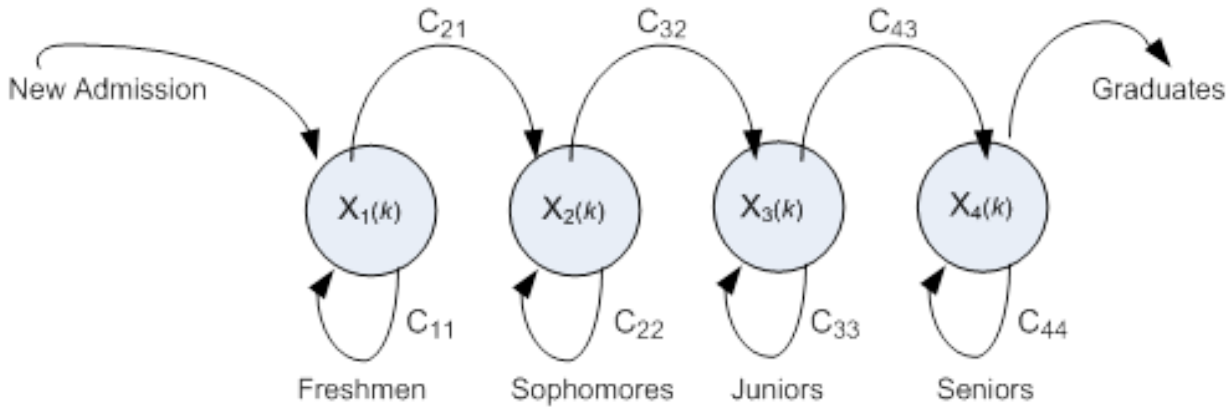
Industry Driven Workforce Model



Key Features

- Industry-driven
- Industry recognized certifications
- Stackable credentials
- Industry-ready experience
- Globally relevant

VSU's Talent Pipeline Model



Talent Transitions:

C21 = Freshman Talent Function ***f_{FT}(FA, PM, T, CR, SPS, I)***

C32 = Sophomore Talent Function ***f_{ST}(FA, PM, I, IM, URE,T, SPS)***

C43 = Junior Talent Function ***f_{JT}(FA, I, URE, IM, SPS, PM*)***

Attributes:

FA= Advising, PM = Peer Mentoring, IM = Industry Mentoring ,CR = Calculus Readiness, T = T utoring, SPS = Student Professional Societies, I = Internships, URE = Undergraduate Research Experiences.

*** Mentor**

Office of Small Business Mentor-Protégé Program

Key Attributes that Foster Movement Along the Pipeline

Peer Mentoring

Research Experiences

Internships

VSU VIRGINIA STATE

Our workforce vision in context

We compete in a capability space. Programs deliver outcomes/ capabilities for a workforce.

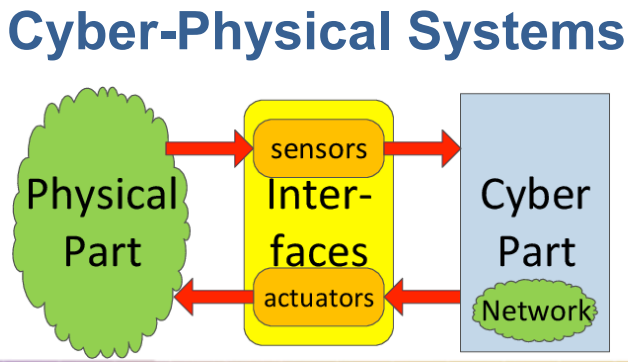
Our key capabilities in context are as follows:

a. ERP Systems (SAP, PLM, ArcGIS, Orbis, CCALS)

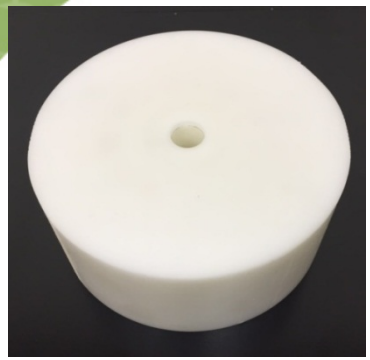
b. Unmanned Vehicles (Drones partnership with Hazon & Dominion VA, CCALS)

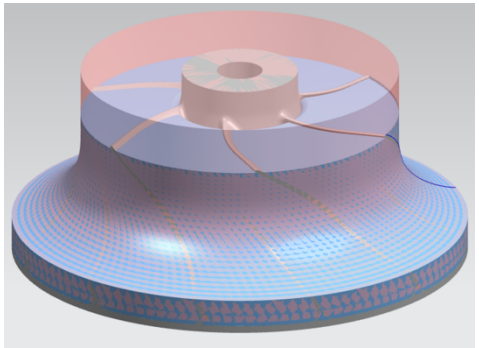
c. Big Data, machine learning, IoT, cyber-security (CCAM)

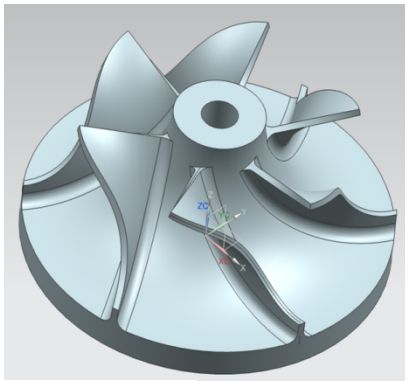
d. Game Theory and Workforce System Optimization (CCAM)



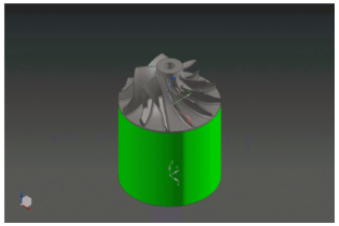
Integrate Value Mapping into various stages of the Manufacturing through OMPS/SAP Integration

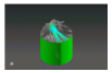
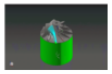
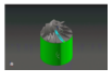
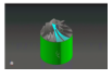




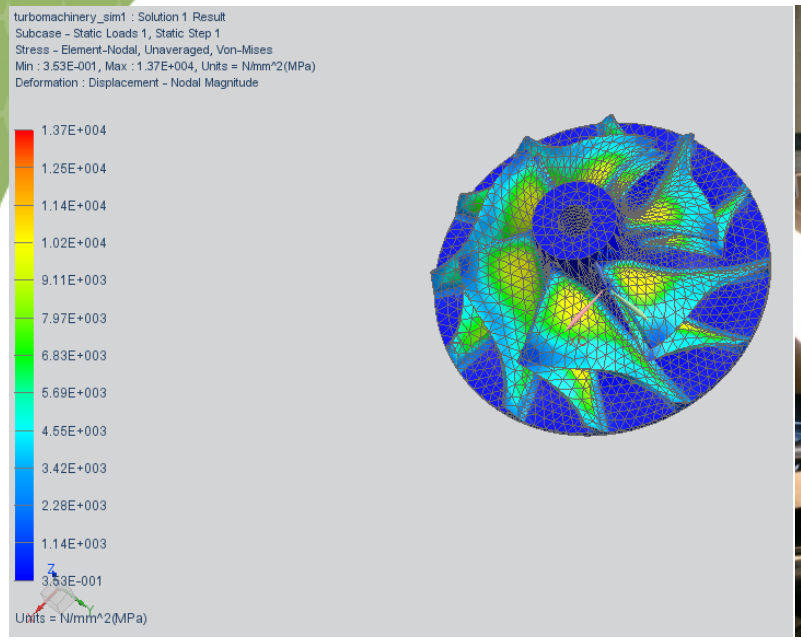


Part name:	turbomachinery_setup_1	Drawing name:	"--"
Unit:	MM	Part number:	"--"
Pictures :		Description :	



Index	Operation Name	Type	Program	Machine Mode	Tool Name	Tool Path Time in Minutes	Path Image
1	MULTI_BLADE_ROUGH	Variable-axis Surface Contouring	1234	MILL	BALL_MILL_7	54.793564368190	
2	BLADE_FINISH	Variable-axis Surface Contouring	1234	MILL	BALL_MILL_7	27.837039054533	
3	SPLITTER_FINISH	Variable-axis Surface Contouring	1234	MILL	BALL_MILL_7	16.618742820463	
4	HUB_FINISH	Variable-axis Surface Contouring	1234	MILL	BALL_MILL_7	24.564799066690	

Integrate value mapping throughout Design, Analysis, and Manufacturing



Analysis of stress

Analysis of Energy

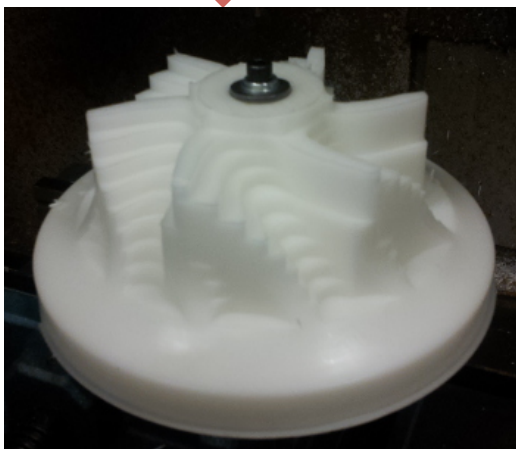
SAP University Alliances

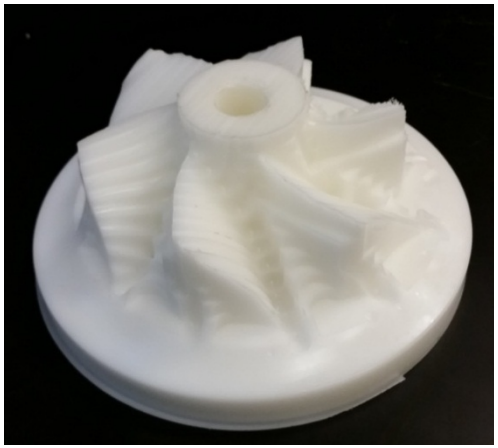
CCALS Commonwealth Center for Advanced Logistics Systems

CCAM COMMONWEALTH CENTER FOR ADVANCED MANUFACTURING

VSU VIRGINIA STATE

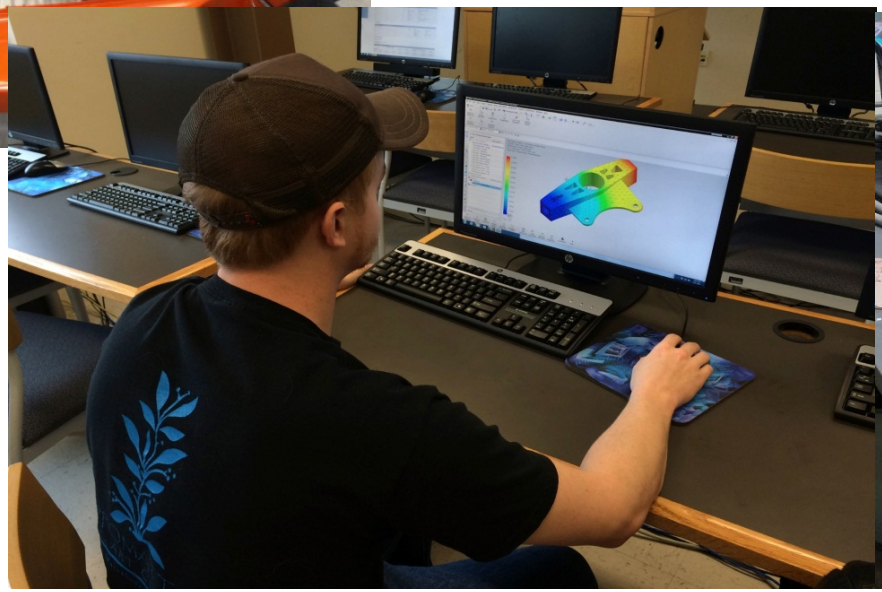
Demonstrate data-to-decisions along the value chain



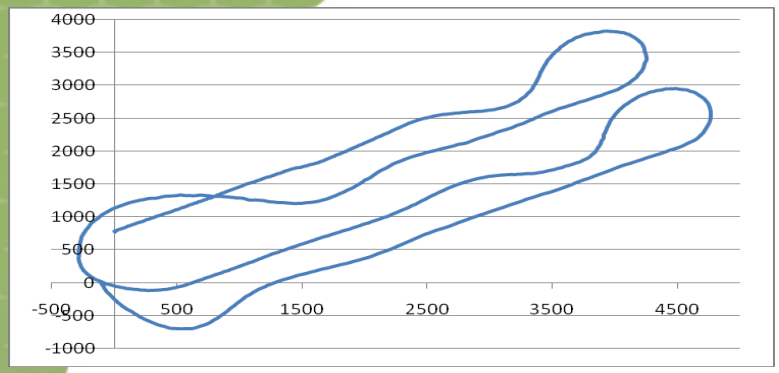


Demonstrate OMPS/SAP, PLM Capabilities through the SAE Formula Car Competition

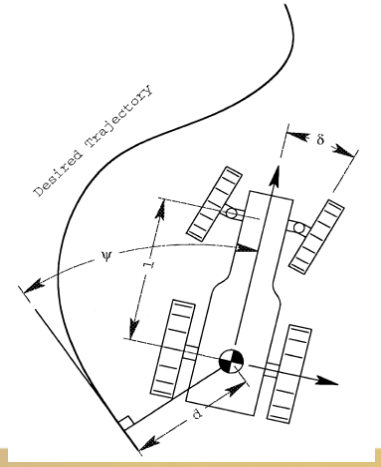
1. CNC Mill and Lathe – PLM/OMPS/SAP
2. FEA, CAD, CAM, 3D Print Rapid Prototype
3. Fabricate components for the suspension
4. Install components and test during competition

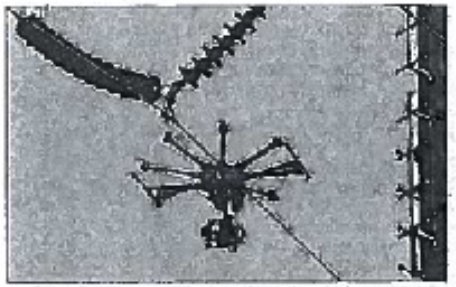


Drone Technology: I-o-T Demonstration



- **Adaptive control for obstacle avoidance and system health**





DOMINION VIRGINIA POWER

The 25- to 30-pound drones would typically hover 8 to 15 feet from Dominion Virginia Power transmission towers.

Va. Power tests drones to inspect power lines

RTD 7/24/15

Camera-equipped devices could replace helicopters

BY JOHN RAMSEY
Richmond Times-Dispatch

Small aerial drones equipped with high-tech cameras soon will begin flying missions to inspect high-voltage power lines for Dominion Virginia Power.

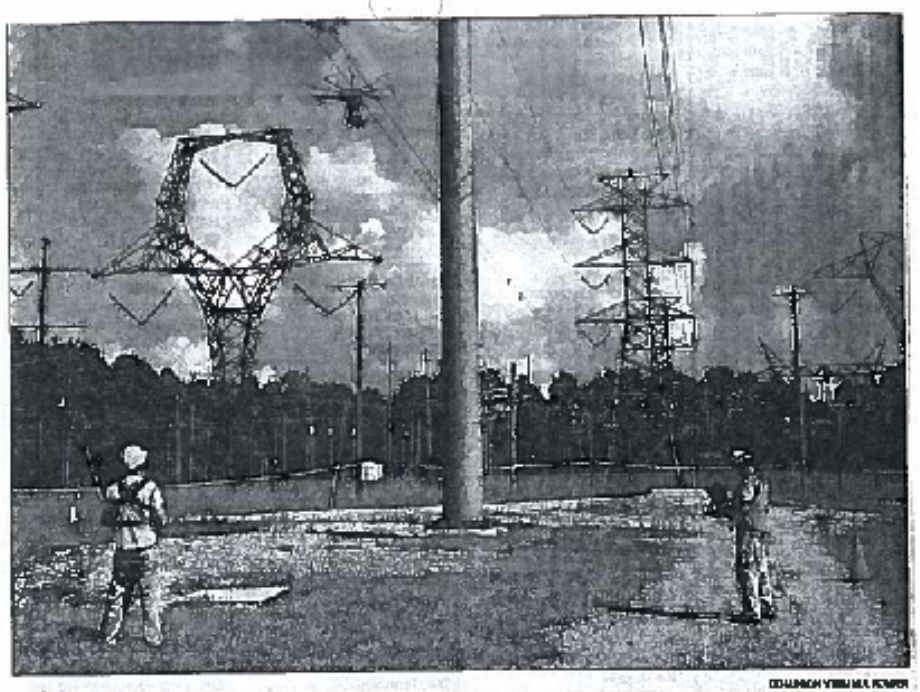
The utility, which has been testing the unmanned aircraft at its Chester training facility since last year, sees the drones having the potential to replace helicopters commonly used to inspect transmission lines.

Their first test around live wires is scheduled for next month in the Northern Neck.

"When you look at a drone in the air versus a helicopter, we look at that as a safety gain for Dominion," said Steve Greenrauch, Dominion Virginia Power's manager of electric transmission forestry and line services.

"We're hoping to be able to provide more reliable service, to find issues on the line and correct

DOMINION, Page A8



DOMINION VIRGINIA POWER

A two-person team would fly each drone, with one controlling the flight and the other operating the cameras.

Dominion

From Page A1

them ahead of time," he said.

Federal regulations require the drones to fly no higher than 200 feet and always within the pilot's line of sight. Dominion Virginia Power is working with three vendors that already have Federal Aviation Administration approval to fly drones for commercial use, including Hazon Solutions of Virginia Beach.

Each 25- to 30-pound drone is flown using a two-person team, with one controlling the flight and the other scanning the area for any safety concerns and operating the cameras.

They typically hover 8 to 15 feet from the transmission towers, where their cameras can zoom with enough precision to read the name plates on individual parts.

Greenrauch said Dominion Virginia Power eventually hopes to use drones after storms to determine exactly where and how lines are damaged before sending in repair crews. Sensors eventually could be added to the drones to provide more data to the company, he said.

Dominion Virginia Power, the state's largest electric utility, has about 6,400 miles of transmission lines, which typically are strung along metal towers and carry electricity over long distances.

Testing has shown the drones can capture photos and video at angles that would be nearly impossible from a helicopter or from a line worker.

Drones have been used for years by the military for bombing and surveillance missions. Companies have started exploring their use in commercial settings, which unlike recreational uses currently are banned by the FAA except for the companies such as Hazon Solutions that have been granted special waivers.

Amazon.com this year announced that it was working on technology that would allow drones to deliver packages to customers within 30 minutes. And last week in Wise County, two drones delivered medical supplies to an annual health clinic.

The FAA is working on rules expected to be released by the end of the year to help balance innovation with safety.

David Cullen, CEO of Hazon Solutions, said the services drones can offer in various business settings are myriad, especially if federal regulations become less stringent and allow drones to become more commonplace.

"The only limitation is going to be our imagination in the future," Cullen said.

jramsey@timesdispatch.com
(804) 649-6911

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VSU VIRGINIA STATE

Thank You !!!

Primary Contact:

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Dean, College of Engineering & Technology