

PI.10 Hemispheric Center for Environmental Technology (HCET) at Florida International University

M. A. Ebadian, Ph.D.
Hemispheric Center for Environmental Technology
Florida International University
Center for Engineering and Applied Sciences
10555 West Flagler Street, CEAS 2100
Miami, FL 33174

Abstract

Since its beginnings in 1995, the Hemispheric Center for Environmental Technology at Florida International University has been steadily positioning itself as the preeminent repository for information on environmental technologies within the DOE, the Decontamination and Decommissioning industry, and the Western Hemisphere. HCET's successful partnership with DOE is founded on proactive research, assessing, developing and communicating new and innovative D&D technologies. These activities are aimed, first at remediating DOE nuclear facilities. In the long term, however, HCET plans to become the major conduit between academic, industrial and government institutions to develop, market and transfer D&D technology throughout the U.S., Latin America, and the Caribbean. HCET's success in this endeavor depends on the strategic direction and sponsorship of the Federal Energy Technology Center.

DOE has charged HCET with the responsibility of researching, developing and demonstrating innovative environmental technologies, and forging alliances that will support their implementation. To this end, HCET has participated in three major large-scale technology demonstration projects (Chicago Pile CP-5 Reactor, Hanford 105-C Reactor and the Fernald Environmental Management Project). HCET's principal roles included identifying and selecting candidate technologies to demonstrate, develop, test and evaluate these technologies. As a result of these demonstrations, several U.S. technology providers have gained invaluable exposure for their products and have actually been contracted to supply D&D services and/or equipment (eg. Concrete Cleaning Inc., TOMCO). Moreover, the international market for D&D technologies is rapidly expanding as other nations and international organizations establish or tighten environmental regulations. This growth in demand presents new opportunities for U.S. industries to enter these markets, and HCET is strategically positioned to market and broker relationships between suppliers and purchasers of D&D technology. HCET is already fulfilling that role in several Latin American countries like Argentina, Mexico and Brazil.

During 1997, the DOE/HCET partnership has produced extraordinary results in identifying and evaluating several promising decontamination, decommissioning and waste management technologies.

Furthermore, through its own research initiatives, HCET has successfully developed, prototyped and tested four technologies that are under consideration for patent application: the

Torsional Wave Sensor, the Oscillating Cylinder Viscometer, and two technologies for the clear separation of vitreous slag from molten metal.

To consolidate more effectively, integrate, and manage the wealth of performance data and experiences gathered during the staging of the above-mentioned technology demonstrations, HCET has completed the groundwork for the development of a comprehensive, Multimedia Information Management and Decision Support (MIDS) system. This system will assist DOE decision makers as well as others in the D&D community to evaluate their D&D needs and select the safest, most cost-effective solution for their projects. Users will have access to definitive information on available technologies that will include:

- health and safety concerns
- operation and performance characteristics
- primary and secondary waste management
- users and providers of technologies
- comparative evaluations of conventional and innovative D&D techniques



Industry

Partnerships to Deploy Environmental Technology



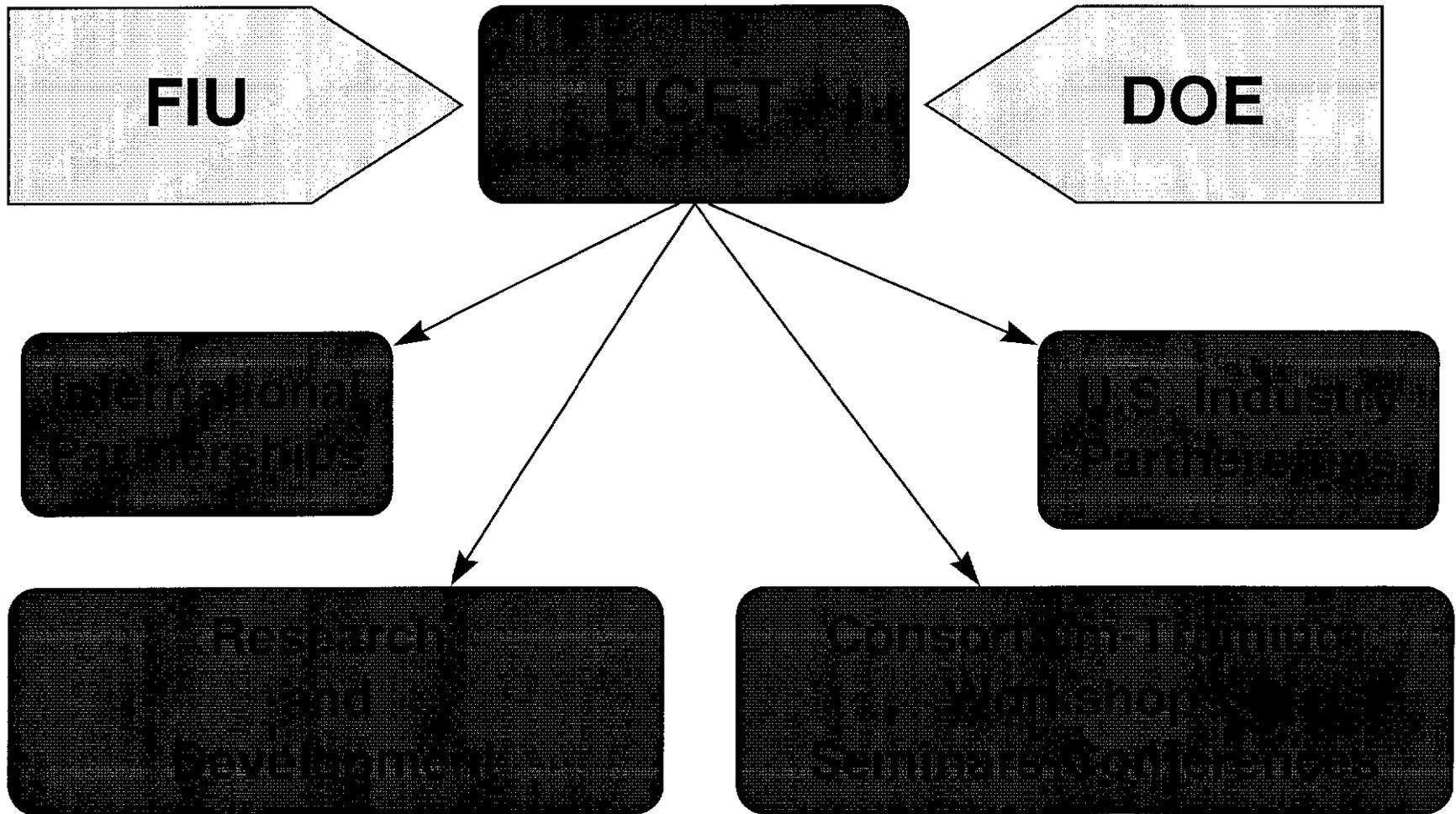
Presented by:

M. A. Ebadian, Ph.D.

Director, Hemispheric Center
for Environmental Technology

October **21-23**, 1997

HCET's Activities



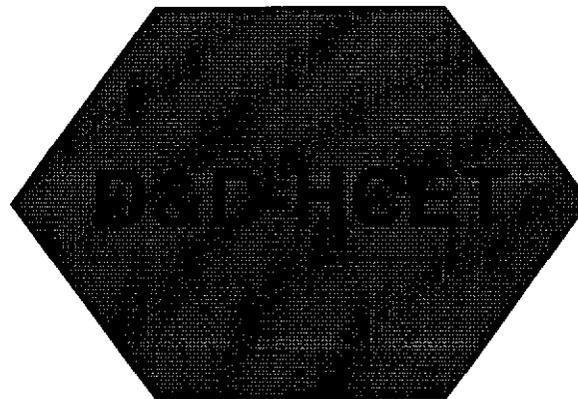


Objectives of the D&D Program

Dismantlement

Decontamination

**Review of non
nuclear solutions**

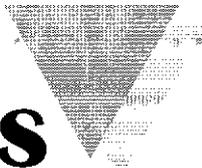


**Facility
characterization**

**Perform reviews of
previous work**

**Perform required applied
research and development**



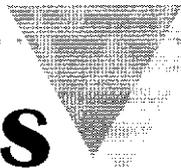


Current Initiatives in the D&D Focus Area

Technology Assessment Initiatives

- ◆ **Decision Analysis Science Modeling for Application and Fielding Selection Applied to Metal and Concrete Decontamination Technologies**
- ◆ **Assessment of Strippable Coatings for Decontamination and Decommissioning**
- ◆ **Decision Analysis Science Modeling for Application and Fielding Selection Applied to Equipment Dismantlement Technologies**
- ◆ **Evaluation of Vertical and Overhead Decontamination Technologies for Masonry Surfaces**

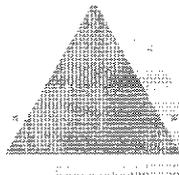




Current Initiatives in the D&D Focus Area

Applied Research and Development Initiatives

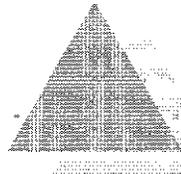
- ◆ **LSDP Technology Information System**
- ◆ **Improved Roof Stabilization Technologies**
- ◆ **Large Bore Pipe Decontamination and Characterization**
- ◆ **Microwave Combustion and Sintering Without Isostatic Pressure**
- ◆ **Melting, Solidification, Remelting and Separation of Glass and Metals**
- ◆ **Decontamination System for Rod Storage Containers**

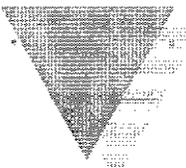




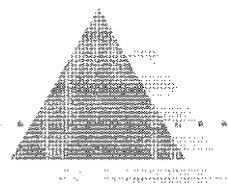
Current Initiatives in the D&D Focus Area

- ◆ **Technical Project Support Activities**
- ◆ **Large Scale Demonstration Projects**
 - ◆ **Fernald**
 - ◆ **CP-5**
 - ◆ **105C Reactor Hanford**
- ◆ **Innovative Technology Review Committee**
- ◆ **Investigation of Potential D&D Technologies for Chicago Operations**

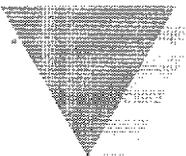




HCET Initiatives with DOE Priority*



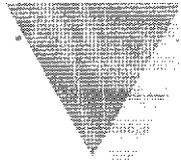
* From *National Needs Assessment*, US. DOE Office of Science and Technology -
Decontamination and Decommissioning Focus Area, METC, July 24 & 25, 1996



HCET Initiatives with DOE Priority*



* From *National Needs Assessment*, US. DOE Office of Science and Technology -
Decontamination and Decommissioning Focus Area, METC, July 24 & 25, 1996



Industry Involvement

The following companies have been involved in the technology assessments:

- ▼ 3M
- ▼ LTC Americas
- ▼ P.W. Stevens
Environmenta
- ▼ Pentek
- ▼ Church and Dwight
- ▼ Pegasus International
- ▼ Textron
- ▼ ICESOLV
- ▼ Bartlett Nuclear
- ▼ AEA O'Donne
- ▼ Concrete Cleaning
- ▼ Applied Radiological
Control
- ▼ Peirpoint Environmental
- ▼ Exitech
- ▼ Custom Coatings





HCET-U.S. Industry Partnerships

- ◆ **HCET establishes partnerships with companies, inventors, entrepreneurs, and financing organizations to facilitate the development, demonstration, commercialization, and implementation of products and services developed by the U.S. environmental industry**



Selected HCET Partners

The image displays a collection of logos for various companies, arranged within a rectangular border. The logos include:

- Epco**: A vertical logo with the word "Epco" written in a bold, sans-serif font.
- 3M**: The logo for 3M, consisting of the letters "3M" in a bold, sans-serif font.
- Duke Power**: The logo for Duke Power, featuring a stylized sun or power symbol and the text "Duke Power" with the tagline "A Duke Energy Company" below it.
- Southern Company**: The logo for Southern Company, which is a circular seal with a shield in the center and the text "SOUTHERN COMPANY" around the perimeter.
- BECHTEL**: The logo for Bechtel, featuring the word "BECHTEL" in a bold, sans-serif font inside a circular emblem.
- ICF KAISER**: The logo for ICF Kaiser, featuring a stylized arrow symbol and the text "ICF KAISER" with the tagline "Worldwide Excellence in Meeting Client Needs" below it.
- ComEd**: The logo for ComEd, featuring the word "ComEd" in a bold, sans-serif font with a stylized starburst or spark symbol.
- SAIC**: The logo for SAIC, featuring the letters "SAIC" in a bold, sans-serif font with a horizontal motion blur effect.
- PARSONS ENGINEERS AND CONSTRUCTORS**: The logo for Parsons, featuring the word "PARSONS" in a large, bold, sans-serif font with "ENGINEERS AND CONSTRUCTORS" in a smaller font below it.
- FLUOR DANIEL FERNALDS**: The logo for Fluor Daniel Fernalds, featuring the words "FLUOR DANIEL FERNALDS" in a bold, sans-serif font with a stylized "S" symbol.



Selected Past and Present Clients



Pratt & Whitney

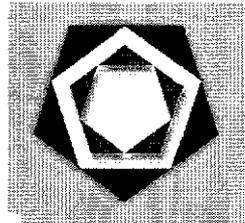
A United Technologies Company



WPI

Waste Policy Institute

A Virginia Tech Affiliated Corporation



**FLUOR DANIEL
FERNALDS**

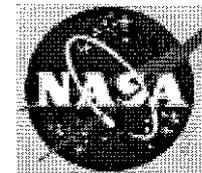


LOCKHEED MARTIN



HANFORD

Environmental Excellence



DE&S

Water Engineering & Services



ICF KAISER

Worldwide Excellence in Meeting Client Needs

oml - *Bringing Science to Life*

PARSONS
ENGINEERS AND CONSTRUCTORS



LAW

ENGINEERING AND ENVIRONMENTAL SERVICES, INC.



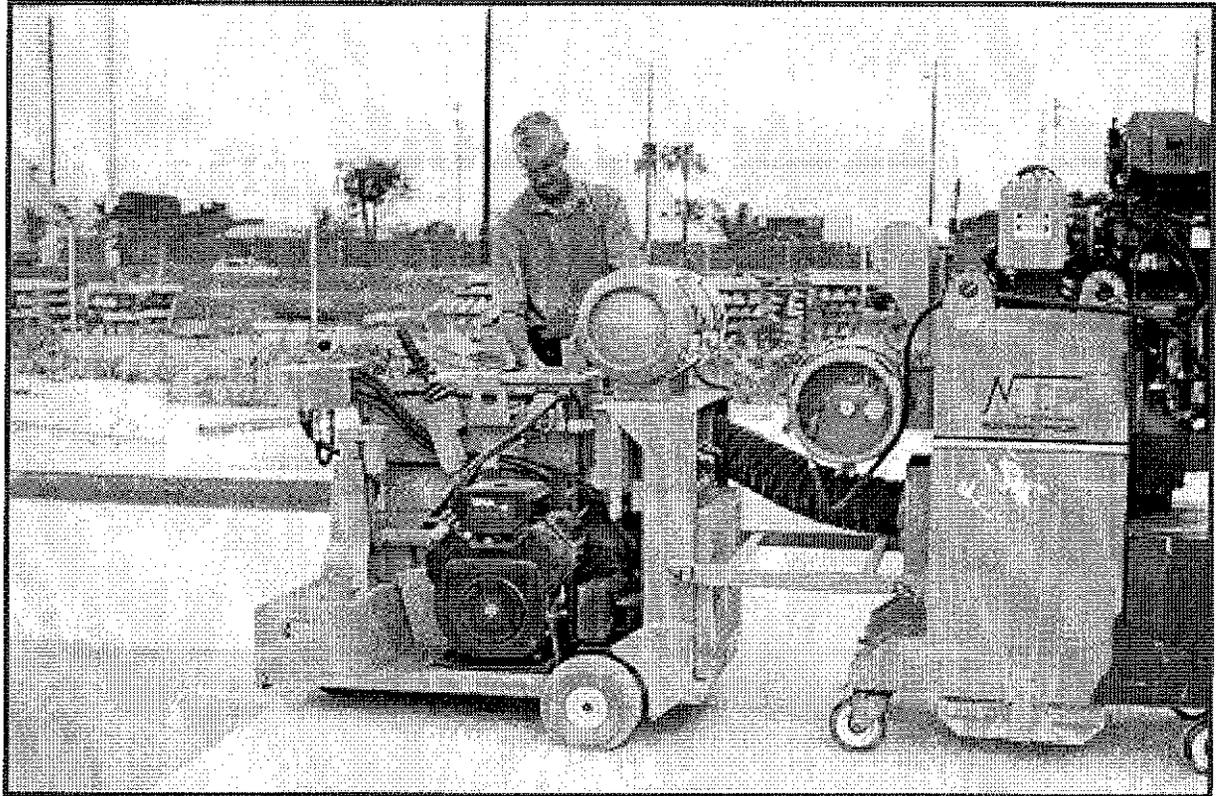
EG&G

Mound Applied Technologies



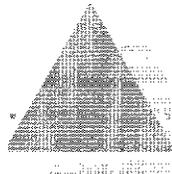
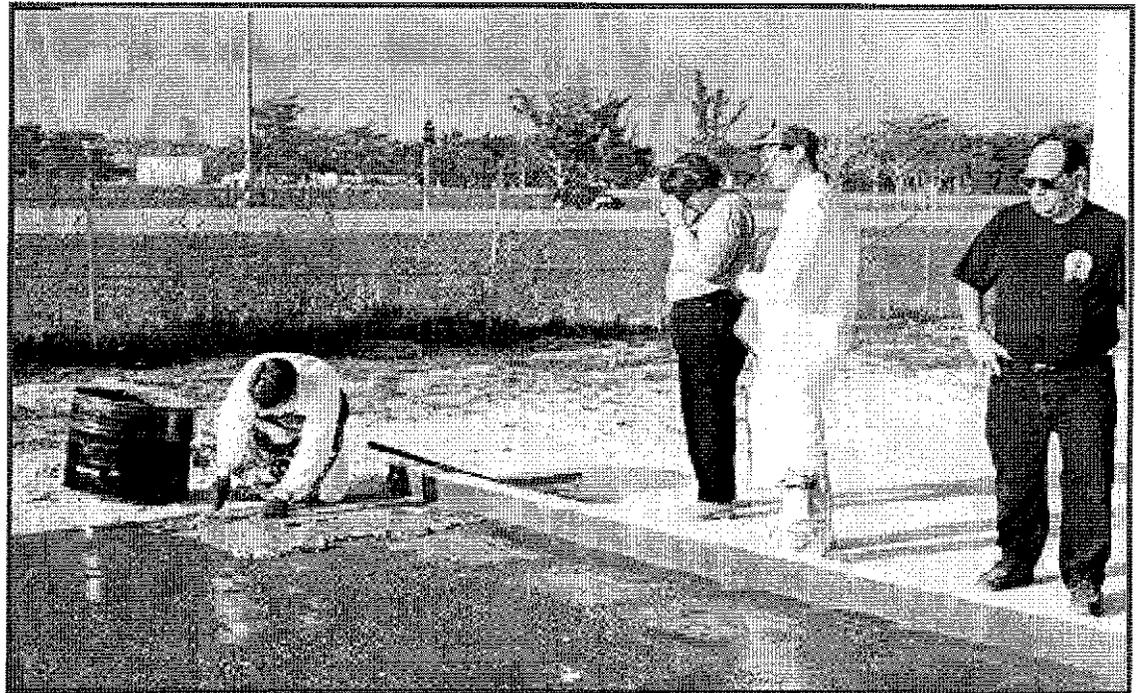
Accomplishments

- ▼ **Technology Name:**
Nelco Porta Sho.
Blast™
- ▼ **Model #:** EC-10-2
- ▼ **Demonstration
Date:** 12/9/96
- ▼ **Technology Class:**
Steel Abrasive
Blasting
- ▼ **Vendor Name:**
J&B Diversified
Services



Accomplishments (cont'd)

- ▼ **Technology Name:**
Pegasus Coating
Removal System
- ▼ **Model #:** PCRS-5
- ▼ **Demonstration**
Date: 3/17/97
- ▼ **Technology Class:**
Coating Remover
- ▼ **Vendor Name:**
Pegasus
International, Inc.



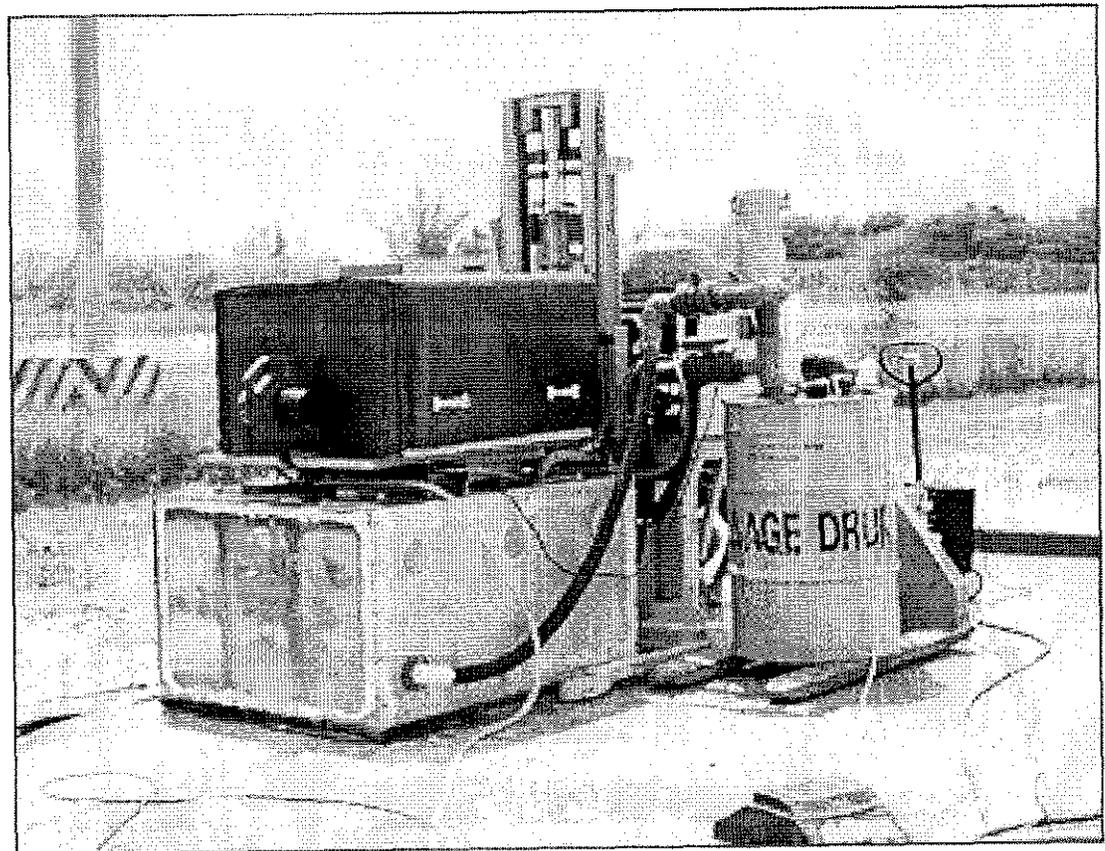
Accomplishments (cont'd)

- ▼ **Technology Name:**
Nelco Porta Shot
Blast™
- ▼ **Model #:**
EE-1-Z
- ▼ **Demonstration Date:**
3/17/97
- ▼ **Technology Class:**
Steel Abrasive Blasting
- ▼ **Vendor Name:**
Pegasus International,
Inc.

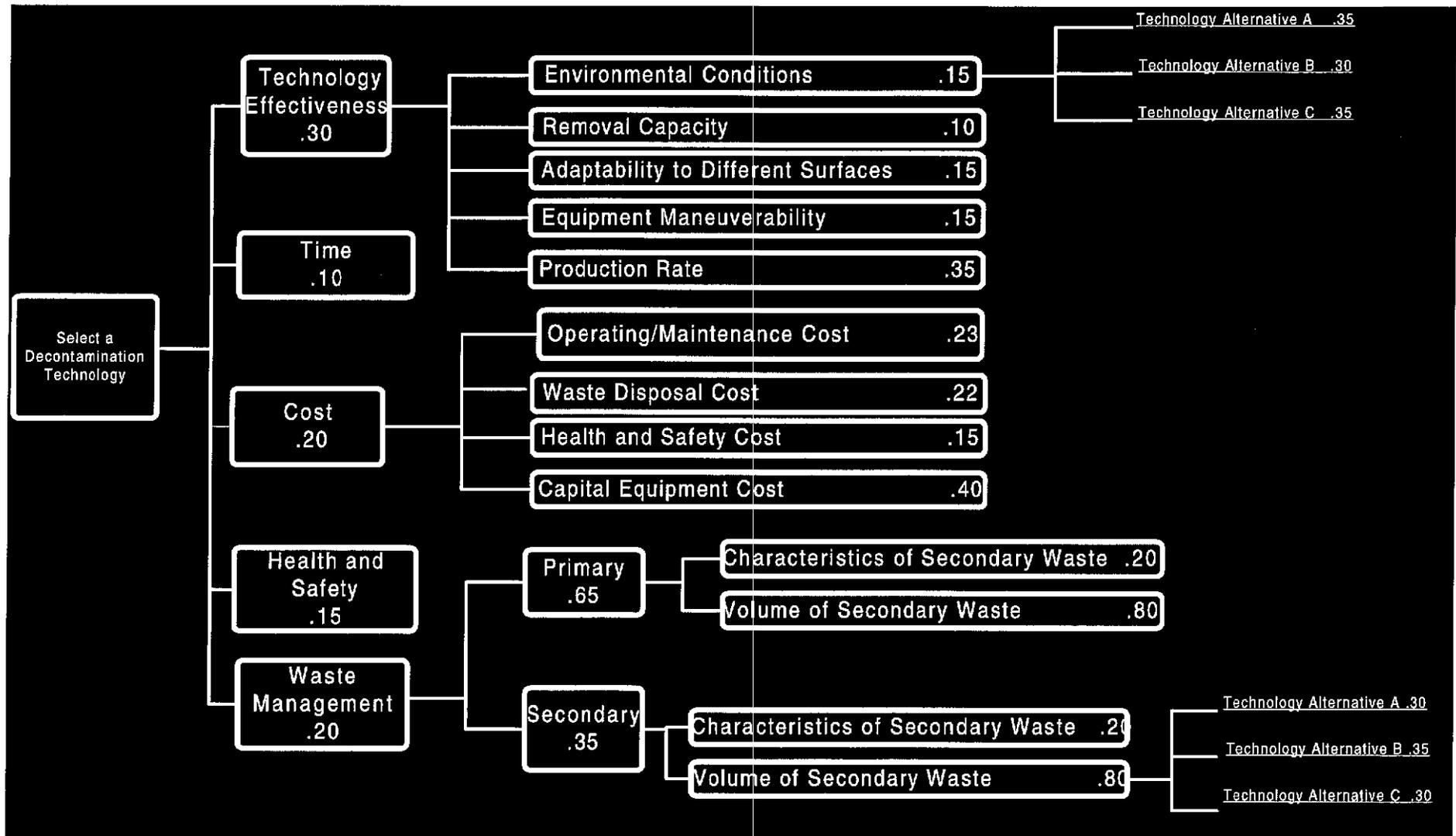


Accomplishments (cont'd)

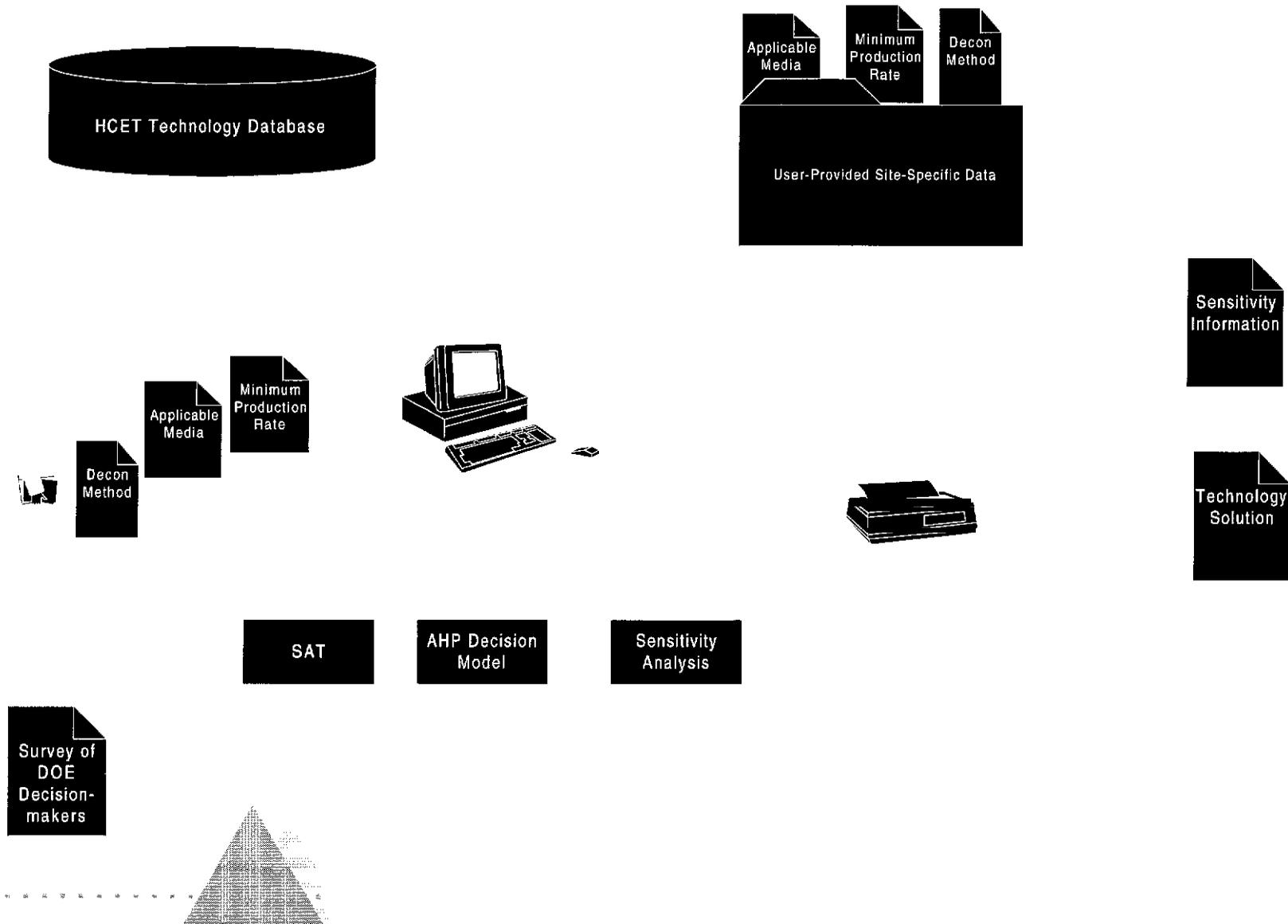
- ▼ **Technology Name:**
Electro-Hydraulic
Scabbling System
- ▼ **Model #:**
Currently in
development
- ▼ **Demonstration Date:**
3/31/97
- ▼ **Technology Class:**
Scarification
- ▼ **Vendor Name:**
Textron Systems
Division



Analytical Hierarchy Tree: Representation of AHP Decision Model



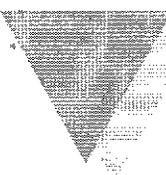
Environmental Technology Decision-Making Tool: Data Flow





Results

- ◆ **Thirty-five technologies have been assessed by FIU-HCET and the International Union of Operating Engineers**
- ◆ **Technologies include innovative and baseline technologies**
- ◆ **Assessments have aided five technologies to be implemented as part of the Large Scale Demonstration Project**
- ◆ **Allowed Concrete Cleaning to be deployed in a Large Scale Demonstration and a commercial project**



FY 98 Initiatives

- ◆ **Continue to assess masonry and metal decontamination technologies**
 - ◆ **Provide Validation and Verification of Sensor Technologies**
 - ◆ **Review systems to perform remote surveillance and maintenance**
 - ◆ **Technology Integration Initiatives**
 - ◆ **Assessment of Equipment Dismantlement and Strippable Coating Technologies**
- 