Illinois Sustainable Technology Center

The Cutting Edge Partnership

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The Cutting Edge Partnership

 Focus upon Reducing the Environmental Footprint of Metalworking Fluids (MWF)

• ISTC and IEPA OPP partnering with manufacturers and vendors

 Promote pollution prevention (P2) and energy efficiency (E2) at facilities using MWF

The Cutting Edge Partnership

- Multi-media: source reduction, green chemistry, chemical management, substitution, process efficiency, in-line recycling, extending MWF life and BMP
- Demonstrate measurable environmental results
- Funded by EPA Region V

Supporting USEPA Region V Goals

Reduce pollution

Conserve natural resources

 Improve environmental stewardship practices

What is MWF and Its Use?

Synonymous with "coolant"

• Lubricates the cutting tool and the workpiece

• Reduces friction, preventing burning & smoking

• Dissipates heat



What is MWF and Its Use?

Transports metal chips away

Improves product quality and extends tool life

 May be a straight oil or a solution containing an oil or synthetic dispersed in water

Why Metalworking Fluids?

• MWF are difficult to treat

 Impose a significant burden on the environment if inadequately treated

Present unique personal health and safety issues

Reducing the Environmental Footprint of Metalworking Fluids The Bottom Line

-Reduce the amount of MWF used and/or disposed

-Extend the useful life of the MWF and/or tooling

-Conserve natural resources: water, chemicals, energy, etc.

-Reduce the cost of "Doing Business"

Technical Assistance Protocol

- Cost of MWF: usage, management and disposal
- Tooling expenditure- direct correlation w/ MWF
- Energy consumption & costs- electricity and gas
- Conservation- water, compressed air, raw materials, etc
- Solid waste- source reduction, reuse or recycle
- Recommendations and opportunities for improvement

Technical Assistance Protocol (cont'd)

- Creation of a detailed, confidential on-site assessment report
- Active discussion of the assessment report with client in person
- Client prioritizes the recommendations
- A program is tailored: information, mentorship(s), on-site assistance, demonstrations, and/or pilot projects
- Change agents through the process

Technical Assistance Protocol (cont'd)

- Development of a trust relationship between ISTC and the client
- Acceptance of technology(ies)
- Accelerated diffusion (ADOP2T)
- Ultimately: reduced costs of the client
- Reduced footprint and impact upon the environments

Demographics and Project Outputs

- 50 candidates within the selected geographic area: Central Illinois
- Small to medium size
- 16 assessments conducted
- 13 Facilities
- 130 Technical assistance visits

Project Output Measurements To Date

5 Full participating MWF partners **8** Non-participating partners **222 Recommendations Identified 96** Recommendations Implemented (43 %)

Project Output Measurements To Date

41 Pilot projects recommended 39 Pilot projects tested 26 Pilot projects implemented (63%) 5 Project tools developed 3 Case studies developed

Recommendations

- Energy Efficient Lighting Upgrade
- Air Compressor Systems
- MWF Reclamation
- MWF Selection
- Solid Waste
- Best Management Practices

Energy Efficient Lighting



Energy Efficient Lighting



Air Compressor Systems



MWF Reclamation UF System



MWF Fluid Purification Unit



Before Fluid Purification Unit



After Fluid Purification Unit



Best Management Practices



Best Management Practices



Conductivity Control



Annual Environmental Outcomes MWF

MWF Conserved, not Disposed: 125,575 Gallons

Water Conserved: 229,570 Gallons

Savings: <u>\$488,050</u>

Annual Environmental Outcomes Energy

Savings Identified: <u>\$532,767</u>

kWh Saved: <u>8,311,230</u>

BTU Saved:

28,359,092,632

Pounds CO2 Eliminated: 7,878,898



