MASTER COPY

Weef Proposals - Fall 1996

Item	Presented by:	Department/Organization	Amount
Control Systems Station	Glenn Heppler	Systems	$9,810
Hard Drive Space	Michael Herz	Civil	$3,200
Uninterruptible Power Supplies	Michael Herz	Civil	$1,300
Refrigerator	Mark Sabon	Civil	$1,000
PH/ISE Meter	Mark Sabon	Civil	$1,950
Levels & Tripods/Transit	Ken Bowman	Civil	$2,825
Topographic Maps	Katherine LaHay	Civil	$6,600
Watstar Upgrades	Roger Sanderson	E&CE	$6,600
Uninterruptible Power Supplies	Roger Sanderson	E&CE	$981
RLC Bridge	Edward Spike	E&CE	$958
VHF Oscillator Source	Edward Spike	E&CE	$1,400
Laptop	W.A.Anderson	Chemical	$1,600
Server and Computer Stations	P. Kotecha/C. Buck	Environmental	$14,500
Master CAM Software	M. Kaptein	Mechanical	$7,392
Materials Tesing Machine	M. Kaptein	Mechanical	$6,000
Equipment for Machine Shop	M. Kaptein	Engineering Machine Shop	$2,125
1.1 GB Hard Drive for Watstar	Beth Jewkes	Engineering Computing	$4,288
4.3 GB Hard Drive for Web Server	Beth Jewkes	Engineering Computing	$1,543
Intermission			
Web Server	Aaron Helleman	E&CE Student	$4,217
Computers for 4th yr. E&CE Room	Randy Hackbart	E&CE Student	$5,000
Hard Disks for 4th yr. E&CE Room	James McLenaghan	E&CE Student	$1,600
Computers for 4th yr. Civil Room	Darren Dickson	Civil Eng Student	$7,559
New Keyboards	David Demner	Chem Eng Student	$160
Wind Energy Conference	D. Elzinga/H. Oberholzer	Mech Eng Students	$200
Part for Glider	Greg Thompson	1997 CASI Freeflight Glider	$2,350
Attendance Costs for Conference	Mark Griffioen	Student Society for Mech Eng	$3,200
Experimental Jet Engine Lab	Michael Brewster	E-JEL Principal Design Group	$1,400
Parts for Car	Steven Peplinski	Mini Baja '97	$1,965
Entrance Fee, Construction, etc.	Jeff Dietz	Snow Warrior	$3,400
Max. Power Point Trackers	Gregory Bridgett	Midnight Sun	$3,500
Parts for car and for testing	Ross Nairn	Team PROPeh?NE	$8,500
Parts and tools for car	Albert Tseng	Formula SAE '97	$2,957
Parts for aircraft	Kyle Schmidt	UW Aero '97	$2,400
Registration and Licenses	Andrew Wang	SAE Aero Design	$835
Start up costs	C. Spear/ G. Catenazzo	Concrete Toboggan '98	$2,000
		Total:	**$125,315**

WEEF Proposal Breakdown - Fall '96

Civil				
Hard Drive Space	Civil	$3,200		
Uninterruptible Power Supplies	Civil	$1,300		
Refrigerator	Civil	$1,000		
PH/ISE Meter	Civil	$1,950		
Topographic Maps	Civil	$6,600		
Levels & Tripods/Transit	Civil	$2,825	**$16,875**	
Environmental				
Server and Computer Stations	Env Eng Students	$14,500	**$14,500**	
Chemical				
Laptop	Chemical	$1,600	**$1,600**	
E&CE				
Watstar Upgrades	E&CE	$6,600		
Uninterruptible Power Supplies	E&CE	$981		
RLC Bridge	E&CE	$958		
VHF Oscillator Source	E&CE	$1,400	**$9,939**	
Systems				
Control Systems Station	Systems	$9,810	**$9,810**	
Mechanical				
Master CAM Software	Mechanical	$7,392		
Materials Tesing Machine	Mechanical	$6,000	**$13,392**	
General Usage				
Equipment for Machine Shop	Engineering Machine Shop	$2,125		
1 1 GB Hard Drive for Watstar	Engineering Computing	$4,288		
4.3 GB Hard Drive for Web Server	Engineering Computing	$1,543	**$7,956**	
	Department Subtotal			**$74,072**
Student Projects				
Parts for Car	Mini Baja '97	$1,965		
Entrance Fee, Construction, etc.	Snow Warrior	$3,400		
Max. Power Point Trackers	Midnight Sun	$3,500		
Parts for car and for testing	Team PROPeh?NE	$8,500		
Parts and tools for car	Formula SAE '97	$2,957		
Parts for aircraft	UW Aero '97	$2,400		
Registration and Licenses	SAE Aero Design	$835		
Start up costs	Concrete Toboggan '98	$2,000		
Part for Glider	1997 CASI Freeflight Glider	$2,350		
Attendance Costs for Conference	Student Society for Mech Eng	$3,200		
Experimental Jet Engine Lab	E-JEL Principal Design Group	$1,400	**$32,507**	**$32,507**
Student Capital Proposals				
Web Server	E&CE Student	$4,217		
Computers for 4th yr. E&CE Room	E&CE Student	$5,000		
Hard Disks for 4th yr. E&CE Room	E&CE Student	$1,600		
Wind Energy Conference	Mech Eng Students	$200		
Computers for 4th yr. Civil Room	Civil Eng Student	$7,559		
New Keyboards	Chem Eng Student	$160	**$18,736**	**$18,736**
	Grand Total			**$125,315**

WEEF Proposal Form
Fall 1996

Proposal Title:	Control Systems Experiment Station
Submitted by:	Glenn Heppler, Leila Fiouzi, Kevin Krauel
Email:	heppler@dial.uwaterloo.ca, lfiouzi@novice.uwaterloo.ca, kbkrauel@kingcong.uwaterloo.ca
Phone Number:	ext. 4648, (519) 886-6435, ext. 5760
Position :	Professor, Student, Lab Director

Description of Proposal:

This proposal is to solicit your financial support in helping the department of Systems Design Engineering update the equipment used in the undergraduate Control Systems Laboratory. The equipment in this laboratory serves as a required teaching aid for the SD 352 (Control Systems) course, however, during the last few years it has become apparent that this equipment is in urgent need of replacement. The experimental equipment that is currently used is 20 years old. it has ceased to work reliably and is starting to breakdown. In addition to that, the available equipment is insufficient in number, as there are currently only four sets of this apparatus in the faculty (for 8 lab stations). The inadequacy of the facilities makes course assignment and lab scheduling very difficult and requires the class to do each experiment over a two week period. The loss of even one of the sets due to equipment failure causes scheduling chaos for the whole course.

The department has researched a number of available educational apparatus and two systems which are a strong candidate for replacing the current equipment have been identified. The candidates are control systems lab apparatus Model 205(Torsional Mechanism) and Model 210 (Rectilinear Mechanism) manufactured by Educational Control Products, 5725 Ostin Ave, Woodland Hills, California, USA. The department wishes to purchase four of each system for a total of 8 systems but is asking WEEF to provide the funding for only *one* of the Model 205 systems. This apparatus consists of a torsional spring, inertia disk and associated data acquisition equipment. The equipment requires PC's with color monitors to act as display units and user interfaces. If this proposal is accepted by WEEF, the department can then use the saved finances for one of the systems to purchase at least 4 PC's to be used with the equipment.

Benefits of the Proposal:

The proposed system can be effectively used in demonstrating topics such as *PID controllers, tracking performance, time domain performance* and *resonance* the SD352 (Control Systems) course. In addition, the apparatus will allow the demonstration and inclusion of new topics such as *system identification, digital control design* and *fuzzy logic control* in the course material. This equipment can also serve as a valuable teaching aid in the SD252 (Signals and Systems) course as well as SD351 (Systems Models 1) course by allowing for a physical demonstration of concepts such as *frequency response, impulse response*, and *damping*. Since SD352 and SD252 are core courses for the Systems Design discipline, the equipment will be used by *all* students that go through the Systems Design Engineering Program.

Cost Breakdown of Proposal:

The single unit that the department is seeking to secure funding for is Model 205 with Controller (Torsional Disk Complete System), with a total price of $9,810 . This price is only in effect if the funding is secured and equipment is ordered by the end of 1996. The new price will be $10,310 .

The complete cost breakdown is as follows:

Model 205 with Controller (Torsional Disk Complete System)	**$7,850.00**
3rd Inertia disk/Encoder	**$ 590.00**
PC bus installation option (improves real-time data collection and plotting speed)	**$ 350.00**
User Written Control Algorithm Package	**$ 480.00**
Interface package option (highly recommended for courses in linear system dynamics and vibrations)	**$ 540.00**
Total	**$9,810.00**

partial is available

Implementation Schedule for the Project:

The equipment will be ordered as soon as WEEF and the departmental funding are secured, and the apparatus should arrive within 5 to 6 weeks after the receipt of purchase order. The manufacturer has informed us that they might be able to get one or two of the systems more quickly, depending on the availability of the stock. We are hoping to have the new equipment operational for the spring 1997 term.

replace old lab equip.
80 students/term

WEEF FUNDING PROPOSALS FALL 1996
DEPARTMENT OF CIVIL ENGINEERING
SUMMARY (Usage/Cost)

Area	Equipment	Amount	Course(s)	Students P.A.
WATSTAR Computing Facility	Hard Drive Space-WATSTAR Servers	$3,200	All Civil, Geological and Environmental Undergraduates and students from other Departments taking Civil courses	750
	Uninterruptible Power Supplies	$1,300	All Civil, Geological and Environmental Undergraduates and students from other Departments taking Civil courses	750
Water Resources/ Environmental Engineering Labs	Refrigerator	$1,000	Civ.E. 375 (Water Quality Engineering), Civ.E. 300 (Project 1); 400 (Project 2); Env.E. Courses	250
	PH/ISE Meter	$1,950	Civ.E. 375 (Water Quality Engineering); Civ.E. 300 (Project 1); Civ.E. 400 (Project 2); Env.E. Courses	250
Survey Camp	Levels & Tripods/Transit	$2,825	Civ.E. 291 (Survey Camp)	150
TOTAL:		$10,275		

(All items of equal priority)

General Note: The Department of Civil Engineering is willing to contribute partial support depending on the WEEF contribution.

WEEF Proposal Form
Fall 1996
DEPARTMENT OF CIVIL ENGINEERING

Proposal Title: Additional Hard Drive Space for WATSTAR Servers

Submitted by: Michael Herz (Computer Systems Manager)
Phone Number: 3411
Email: mherz@civoffice

Date of Submission: October 31, 1996

Description of Proposal: The hard drive space for applications is ever increasing and we are getting close to capacity. Another hard drive is required to increase our capacity. The drives would be for the Civil and Bridge servers.

Benefits of the Proposal: All Civil/Geological/Environmental (Civil) Engineering Undergraduates (750 per annum).

Cost Breakdown of Proposal: $3,200. 2- 4 Gig Scsi Drive

Implementation Schedule: Immediately.

Would partial funding to the cost estimate provided above be acceptable? YES

WEEF Proposal Form
Fall 1996
DEPARTMENT OF CIVIL ENGINEERING

Proposal Title: Uninterruptible Power Supplies for WATSTER Servers

Submitted by: Michael Herz (Computer Systems Manager)
Phone Number: 3411
Email: mherz@civoffice

Date of Submission: October 31, 1996

Description of Proposal: We have frequent power fluctuations/failures on campus causing problems for the WATSTAR servers. The major problems are data loss and reboot failures. An Uninterruptible Power Supply will keep the servers running through these power failures. Most power failures can last from 10 seconds to 15 minutes on average.

Benefits of the Proposal: All Civil/Geological/Environmental (Civil) Engineering Undergraduates (750 per annum).

Cost Breakdown of Proposal: 2 @ $650.

Implementation Schedule: Immediately.

Would partial funding to the cost estimate provided above be acceptable? YES

WEEF Equipment Proposal
Fall 96

Item: PH/ISE Meter.

Submitted by: Mark Sobon **Date:** October 30, 1996

Description of Equipment: PH/ISE Meter. Orion Model 720 A.

Benefits of equipment: There is a need for an another pH/ISE meter to service ENV 275 and CIV 375(approx. 200 students per year) water quality labs. The additional meter would reduce the wait time for pH and ISE measurements in both labs.

Cost of Proposal: $1950/Each.

Implementation Schedule: Immediate.

Additional Information:

Would partial funding to the cost estimate provided above be acceptable? YES

WEEF Equipment Proposal
Fall 96

Item: Refrigerator.

Submitted by: Mark Sobon **Date:** October 31, 1996

Description of Equipment: Refrigerator, 20 Cubic Foot.

Benefits of equipment: A refrigerator is needed for undergraduate and general lab use. The addition of ENV 275 has increased demand for refrigeration capacity in the teaching lab Rm 3506. The refrigerator would allow for additional refrigerated storage space for the ENV 275 and CIV 375 labs (Approx. 200 Students per year).

Cost of Proposal: $1000/Each.

Implementation Schedule: Immediate.

Additional Information:

Would partial funding to the cost estimate provided above be acceptable? YES

WEEF Proposal Form
Fall 1996
DEPARTMENT OF CIVIL ENGINEERING

Proposal Title: Levels/Tripods (2) and Transit (Survey Course - Civ.E. 291)

Submitted by: Ken Bowman (Technologist - Civil Engineering)
Phone Number: 3656
Email: kbowman@civoffice

Date of Submission: October 31, 1996

Description of Proposal: Used for Civ.E. 291 (Measurements and Surveying Course). The Department is upgrading the antiquated surveying equipment (some 30 years old) on a continuous basis. This proposal is to add two autolevels, two tripods and one transit to its equipment complement. There are usually twenty groups (4 students per group) at each survey camp and twenty instruments in total are required. All Civil/Geological/Environmental Engineering students must pass this course fot the degree of BASC (Civil/Geological/Environmental Engineering).

Benefits of the Proposal: All first-year Civil/Geological/Environmental (Civil) Engineering Undergraduates (150-175 per annum).

Cost Breakdown of Proposal: $2,825.

Implementation Schedule: Immediately.

Would partial funding to the cost estimate provided above be acceptable? YES

WEEF Proposal Form

Fall 96

Proposal Title: TOPOGRAPHIC MAPS Email: klahay@scibor.sq

Submitted by: KATHERINE L. LAHAY Phone Number: X 6957

Position (Student, Professor, Organization, etc.): INSTRUCTOR

Description of Proposal:

NEW TOPOGRAPHIC MAPS ARE REQUIRED FOR CE 253 GEOLOGY LABS. THE SUBJECT MATTER COVERED INCLUDES GLACIAL PROCESSES, COASTAL PROCESSES, KARST TOPOGRAPHY, MASS MOVEMENT AND FLUVIAL PROCESSES. THE PRESENT LABORATORY MAPS ARE VERY OLD, OF AMERICAN EXAMPLES AND NOT ALWAYS APPROPRIATE EXAMPLES OF THE REQUIRED FEATURES AIR PHOTOS TO ENHANCE THE LABS.

Benefits of the Proposal (including number of department(s), courses and students affected):

CE 253 FALL & SPRING ABOUT 50-60 STUDENTS / TERM
ONE SET OF MAPS PER 2 STUDENTS WOULD FACILITATE LEARNING. (AT PRESENT THERE ARE TOO FEW MAPS FOR THE LABS TO FUNCTION SMOOTHLY. GROUPS ARE TOO LARGE.) STUDENT TIME COULD BE BETTER SPENT CAREFULLY STUDYING SELECTED MAPS IN PAIRS, EACH STUDENT WOULD HAVE MORE TIME WITH EACH MAP.

Cost Breakdown of Proposal (including partial funding options if desired):

1.	GLACIAL MAPS + AIR PHOTOS	MAPS 15 COPIES OF 5 @ 10.00 AIRPHOTOS 3 X 15 SETS OF 2 @ 20.00		750.00 1800.00
2.	COASTAL PROCESSES + AIR PHOTOS	MAPS 15 COPIES OF 4 @ 10 AIRPHOTOS 15 SETS OF 2 @ 20.00		600 800
3.	KARST TOPOGRAPHY + AIR PHOTOS	MAPS 15 SETS OF 2 @ 10.00		300
4.	MASS MOVEMENT	AIR PHOTOS 15 SETS of 2 @ 20.00		600.00
5.	FLUVIAL PROCESSES + AIR PHOTOS	2 X 15 SETS of 2 @ 20.00 MAPS 15 COPIES OF 5 @ 10.00		1200.00 750.00
				6600.00

Implementation Schedule for Project:

AVAILABILITY FOR MAY 97 WOULD BE WONDERFUL
ONE GROUP AT A TIME IS OK TOO

Additional Information:

EACH MAP COSTS ABOUT $10.00 GST + PST INCLUDED
AIR PHOTOS COST ABOUT 10.00 EACH; A PAIR, $20.00
LAB SIZE IS 30 STUDENTS, OFTEN MORE.
15 COPIES/SETS OF EVERYTHING ACCOMMODATES A CLASS SIZE OF 30 WORKING IN PAIRS.

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Form

Fall 96

E&CE

Proposal Title: **Watstar Computer Room Pentium Upgrades**

Submitted by: Roger Sanderson *Phone* Number: Ext. 6184

Bill Ott presenting

Position (Student, Professor, Organization, etc.): E. & C. E. Department Lab Technologist

Description of Proposal:

open 24hr to all students

Computer technology, and in particular MS-DOS based computers are improving at a rapid rate. Systems purchased a year or two ago are now outdated. New software applications are demanding more memory, more hard disk space, and more processor speed. The Electrical and Computer Engineering Department's Watstar rooms currently contain a mix of XT, 286, 386, 486, and Pentium computers. We see Watstar moving towards Windows 95 in the next year or so. These software versions make more demands on the hardware than ever before. Many of our current machines cannot even run Windows 95 and the ones that can are just barely able to do it.

In the past, we've always bought a computer here and a computer there. This leads to our having a real hodgepodge of different machines, all in the same room. No one room has any consistency to it. This complicates maintenance and support, and makes things annoying for the students (since something which works well on one computer works badly on the computer right next to it in the same room).

In light of these problems, we have decided to look at a long term plan for upgrading our computer resources. We propose to upgrade a whole room at one time. We have started by upgrading one room, E2-2362. This was completed at the start of this term. The next step is to upgrade room E2-2360. This is our 24 hour access Watstar room. It currently has 486's that were displaced by the first Pentium purchase. If we upgrade this room to Pentiums, these 486's would be moved to other rooms to update 386s which would in turn update 286s etc. etc.

The net result is that E2-2360 and E2-2362 would be entirely Pentium machines. We would have improved four rooms altogether, created greater consistency within rooms, and taken a further step towards being able to support Windows 95.

Since each new machine will have to last for many years, we should make sure we get machines that are powerful enough (in terms of processor and memory) that they will meet our needs through the year 2000 and beyond. Currently, a Pentium-133, 16 meg ram with a 1.5 gig hard drive should be a minimum.

Benefits of the Proposal(including number of department(s) and students affected):

The proposal would improve the computers in four of E. & C. E.s Watstar rooms. The new computers will be in our 24 hour access public rooms, so all Engineering students would have access. The other two rooms that would be upgraded from 386s are used by second and third year E&CE students. These would be used by about 200 students per term.

Cost Breakdown of Proposal(including partial funding options if desired):

A Pentium P-133 with 16 meg ram, a 1.5 gig hard drive, large monitor, and network interface would currently cost about $2200. We are proposing to buy 10 machines for room E2-2360. The department will supply funds for some of these machines, and we are asking WEEF to help out by supplying some as well. We are suggesting that WEEF buy 3 computers for a total of $6600. Partial funding for anything from one machine ($2200) up to ten ($22,000) would be welcome.

Implementation Schedule of Project:

If department funds can be found in time, we would like to implement the room upgrade in December, so that it will be ready for the Winter 97 term. If that proves too early, then the installation would have to be done in April. This is a major lab renovation, and can only be done between terms.

Additional Information:

In order of priority

WEEF Proposal Form

Fall 96

E & CE

Proposal Title: **Uninteruptable Power Suppies for servers**

Submitted by: Roger Sanderson *Phone* Number: Ext 6184

Position (Student, Professor, Organization, etc.): E. & C. E. Department Lab Technologist

Description of Proposal:

The E&CE department has a network of Sun Workstaions connected to a Sun UltraSparc Server. Whenever there is a power outage, even a short "glitch", the server re-boots. Due to the nature of the Unix, the re-boot can take up to 30 minutes to complete. Meanwhile the workstaions have long since been re-booted, but the users cannot work until the server comes back up. Also in some instances the server has not come back at all, and manual intervention is needed. If this happens on a weekend, there could be as many as two days of downtime. During the summer months (the thunderstorm season) we experience a number of short duration power outages. A UPS would allow the server to ignore most of these outages. For a longer duration outage, the UPS would allow a proper, controlled shutdown of the Unix system. We are proposing to buy a UPS that is of sufficent size to handle the server and all its peifherals.

Benefits of the Proposal(including number of department(s) and students affected):

These Unix based systems are used by all forth year and some third year E&CE students. The UPS would eliminate long down time due to short power outages. Also the server suppies the E&CE department's Web space and FTP site.

Cost Breakdown of Proposal(including partial funding options if desired):

American Power Conversion Smart-UPS 1400: $887+Tax = $981
Partial funding would be acceptable, with the E&CE department supplying the difference.

more expensive than Civil, because of power requirements

Implementation Schedule of Project:

We would like to install the UPS in December, so that it will be ready for the Winter 97 term. If that proves too early, then the installation would have to be done in April. This is a major installation, and can only be done between terms.

Additional Information:

EECE

WEEF Proposal Form

Fall 96

Proposal Title: RLC Bridge Email: spike@eestaff.watstar

Submitted by: Edward Spike Phone Number: x3716

Position (Student, Professor, Organization, etc.): "Lab Instructor"

Description of Proposal:

Addition to existing equipment. Lab section size will double, with twice the number of students in the Graphics Lab ~~at~~ one time.
Ten bridges exist for lab. Should add three or four more.

Benefits of the Proposal (including number of department(s), courses and students affected):

First year laboratory use ie: EiCE-100 with 100+70 students in two streams.

Cost Breakdown of Proposal (including partial funding options if desired):

Model GR1650A approx $1000.00 Canadian with taxes.
Supplier: Tucker $555(US) x 1.40 = $833 (x1.15) = $958 Cdn

asking $1000

Implementation Schedule for Project:

January 1997.

Additional Information:

Bridges are used in other EiCE courses. ie: 241, 332

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Form

Fall 96

E&CE

Proposal Title: VHF Oscillator Source Email: spike@eestaff.watstar

Submitted by: Edward Spike Phone Number: x 3716

Position (Student, Professor, Organization, etc.): "Lab Instructor"

Description of Proposal:

Addition and replacement of VHF Oscillator Source adjustable between 220 MHz and 920 MHz plus power supply

Benefits of the Proposal (including number of department(s), courses and students affected):

Increase number of workstations from 6 to 8.
Slotted lines and meters exist.
For: E&CE-471 with 60+90 students core course for Electrical.
E&CE-473 with 15 students
E&CE-474 with 10+10 students

Cost Breakdown of Proposal (including partial funding options if desired):

GR 1362 (or 1209-B or 1361-A) Oscillator } $1400.00 Cdn
GR 1201-B (or 1267-A or 1267-B) Power Supply }

Implementation Schedule for Project:

January 1997

Additional Information:

The Model will depend on the availability at purchase time.

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Form

Fall 96

Proposal Title: Laptop computer for student presentations and teaching Email: wanderson@chemical

Submitted by: W.A. Anderson Phone Number: Extension 5011

Position (Student, Professor, Organization, etc.): Asst. Prof., Dept. of Chemical Engineering

Description of Proposal:

In 4th year Chem. Engineering, the students are asked to present 1-2 major seminars, and the majority choose to use Microsoft Powerpoint. In the past, the department has provided a desktop computer linked to WATSTAR for this purpose. However, in our experience this has been less than satisfactory in practice due to slow network response and delays while students login and logoff. This past summer in ChE 040, the students booked and used the EngSoc laptop to use for these seminars as a stand-alone computer, with very good results. This proposal requests funding so that the Dept. of Chemical Engineering can continue and expand this approach, possibly to other courses.

In addition, circumstances arise where faculty might want to demonstrate certain specialized software, or solve complex problems with some graphical output for the benefit of a lecture class. At present the Department has a computer-aided teaching lab where each student has their own workstation and this demonstration can be done. However, use of this room is not appropriate when it is for demonstration purposes only, and the students do not require "hands-on" use at that point. Therefore, it would be beneficial for the Chem. Eng. faculty and staff to have access to the laptop with the specialized software pre-loaded for use in these in-class demonstrations. To support this approach, the Department will pay for one-half the cost of the proposed laptop.

Benefits of the Proposal (including number of department(s) and students affected):

The computer would be available to students for use in Powerpoint presentations, and to demonstrate software that they have used or developed in courses. All Chem. Eng. students participate in 4th year seminars in 4B, and often also in 4A. Therefore at least 100 students per year would benefit from this purchase, up to twice per year. The computer would also be available for student use during the technical speakers' competition, and potentially other special occasions.

In addition, the laptop will be available for use by faculty in lectures or tutorials to demonstrate specialized software and illustrate more complex chemical engineering problems. Example applications would be in courses for air pollution control, process flowsheeting, process control, physical chemistry, reactor engineering, etc.

Cost Breakdown of Proposal (including partial funding options if desired):

This application requests $1600., which would be one-half the estimated cost of a suitable laptop computer. The Department of Chemical Engineering will contribute the remaining $1600. The proposed laptop would consist of a 100 MHz Pentium processor, 800 Mb HD, colour VGA LCD screen, and an Ethernet card for download access to WATSTAR.

Implementation Schedule for Project:

The proposed computer would be purchased as soon as possible, and made available for use in the Winter 1997 term when a substantial number of fourth-year project seminars take place.

Additional Information:

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF PROPOSAL FORM

Fall '96

PROPOSAL TITLE

Purchase of an Environmental Engineering Sever and Computer Stations

Submitted by:	Prit Kotecha	**Email :**	pkotecha@wedge	**Phone:**	742-3151
	Charles Buck		cpbuck@civil		888-0600

DESCRIPTION OF PROPOSAL

Funding from WEEF will be used for the purchase of a computer server and computer stations. This equipment would be located in the new Environmental Engineering study room, formerly the 4th Year Electrical Engineering study room.

Ideally the project will include the purchase of 10 workstations and a server. This will be suitable for all future students in both environmental engineering programs. Funding of five stations and a server, as in Option 2, is considered adequate for the current number of students enroled in both programs.

IMMEDIATE BENEFITS

- The server and computer stations would be used by all upper year, **2A+, environmental engineering students in both the chemical and civil departments**. The implementation of the all options would affect the following number of students in Spring 1996:

Enviro (Chem)	2B (1994) - 30
	2A (1995) - 32
Enviro (Civil)	2B (1994) - 16
	2A (1995) - 35

  Total number of students affected: 113
  The year represents the date the students commenced

- The addition of an Env Eng server would **reduce the server and computer load** of chemical and civil servers.

- Presently, all Env Eng(Chem) students are operating on the computer server "wedge" with the first year students. Acquiring a server, will give Env Eng an **identity in engineering**.

- Environmental Engineering in both departments has existed for two years, yet our program is still unfamiliar to the greater student population. Utilizing WEEF funding will increase **student awareness** of the program in engineering.

WEEF PROPOSAL FORM

Fall '96

PROPOSAL TITLE

Purchase of an Environmental Engineering Sever and Computer Stations

Submitted by:	Prit Kotecha Charles Buck	**Email :**	pkotecha@wedge cpbuck@civil	**Phone:**	742-3151 888-0600

DESCRIPTION OF PROPOSAL

Funding from WEEF will be used for the purchase of a computer server and computer stations. This equipment would be located in the new Environmental Engineering study room, formerly the 4th Year Electrical Engineering study room (E1-1532).

Ideally the project will include the purchase of 10 workstations and a server. This will be suitable for all future students in both environmental engineering programs. Funding of five stations and a server, as in Option 2, is considered adequate for the current number of students enroled in both programs. Funding of 3 computers and a server, as in Option 3 has the advantage of low cost, however may not accommodate for all students.

BENEFITS OF THE PROPOSAL

- The server and computer stations would be used by all third year students enrolled in **environmental engineering from both the chemical and civil departments.** This would affect 46 students.

- If study room is accommodating for further students, there is the possibility of **including second year students.**
  There is the possibility of affecting the following number of students:

Year	96-97			97-98			98-99		
	F	W	S	F	W	S	F	W	S
94 Env Chem	23		23		23		23	23	
94 Env Civ	16		16		16		16	16	
95 Env Chem		32		32		32		32	
95 Env Civ		41		41		41		41	
96 Env Chem	45	45		45		45		45	
96 Env Civ	43		43		43		43		43
97 Env Chem				*50*	*50*		*50*		*50*
97 Env Civ				*50*		*50*		*50*	
Total	**39**	**73**	**39**	**118**	**82**	**118**	**39**	**39**	**93**

Note 1: Italics signify an estimated number of students
Note 2: Small point indicates 1st year students (not taken into account in total)

IMPLEMENTATION SCHEDULE FOR PROJECT

OPTION 1: Immediate - for usage in Spring 97
OPTION 2: Immediate - funding for further computers will be requested in future terms
OPTION 3: Immediate - funding for further computers will be requested in future terms

ADDITIONAL INFORMATION

BENEFITS/DRAWBACKS FOR EACH OPTION

Option 1: By obtaining greater number of workstations now:

BENEFITS

- Easy transition to fourth year Study Room
- Ample access to computer stations
- Ability to easily accommodate second year students

DRAWBACKS:

- Option is expensive

Option 2: By obtaining a reasonable amount of workstations now:

BENEFITS:

- cost is reasonable
- computers will be fully utilized
- ability to accommodate second year students

DRAWBACKS:

- funding may not be available for fourth Year Study Room

Option 3: By obtaining a minimal amount of workstations now:

BENEFITS:

- Low cost

DRAWBACKS:

- Inadequate number of computers for the number of students
- Limited availability of computers
- Inability to accommodate second year students
- Funding may not be available for fourth year study room

- All disciplines of engineering have a study/computer room where students are able to work together. As the environmental program begins to separate from their respective departments, **group interaction** within the program will become essential. It is necessary to have an exclusive room where students can work together on projects, labs, and assignments. This will require computers.

LONG TERM BENEFITS

By 1999, the program will have reached full capacity. By obtaining a greater number of computers now, it will ensure that all students will have access to an adequate number of computer stations.

COST BREAKDOWN OF PROPOSAL

OPTION 1 : Full Funding

ITEM	No. of units	Unit Price	TOTAL
Server		$2,000.00	$2,000.00
Stations	10	$1,600.00	$16,000.00
Network eqpt.	10	$100.00	$1,000.00
		SUB TOTAL	**$19,000.00**
		TOTAL	**$14,500.00**

OPTION 2 : Funding of 5 computers and server

ITEM	No. of units	Unit Price	TOTAL
Server		$2,000.00	$2,000.00
Stations	5	$1,600.00	$8,000.00
Network eqpt.	5	$100.00	$500.00
		SUB TOTAL	**$10,500.00**
		TOTAL	**$6,000.00**

OPTION 3 : Funding of 3 computers and server

ITEM	No. of units	Unit Price	TOTAL
Server		$2,000.00	$2,000.00
Stations	3	$1,600.00	$5,400.00
Network eqpt.	3	$100.00	$300.00
		SUB TOTAL	**$7,700.00**
		TOTAL	**$3,200.00**

Note: The total is the funding requested from WEEF for the desired option. The remaining funding will be acquired from the chemical and civil engineering departments.

The prices were obtained from Dennis Herman of The Department of Chemical Engineering.

IMPLEMENTATION SCHEDULE FOR PROJECT:

OPTION 1: Immediate - for usage in Spring 97
OPTION 2: Immediate - funding for further computers will be requested in future terms
OPTION 3: Immediate - funding for further computers will be requested in future terms

ADDITIONAL INFORMATION:

Benefits/Drawbacks for each Option

OPTION 1: By obtaining greater number of workstations now:

- will ensure that long-term benefits are satisfied
- will ensure that students have access to computers
- option is expensive

OPTION 2: By obtaining a reasonable amount of workstations now:

- cost is reasonable
- most students will have access to computer, except during peak hours
- computers will be fully utilized
- increased possibility that long-term benefits are not satisfied

OPTION 3: By obtaining a minimal amount of workstations now:

- cost is very low
- inadequate number of computers relative to the number of students
- most students will have minimal access to computers
- increased possibility that long-term benefits are not satisfied

WEEF Proposal Form

Fall 96

Proposal Title: MASTER CAM SOFTWARE Email:

Submitted by: M. KAPTEIN Phone Number: 3026

Position (Student, Professor, Organization, etc.): DIRECTOR, MECHANCIAL ENGINEERING LABS.

Description of Proposal:

The course ME 548 has been using ICAM software for student instruction since 1988. This software is no longer supported by its manufacturer. New software is needed to improve the course by using CAD/CAM software which allows the generation of tool paths for up to 5 axis machining. The mould and die industry is a strategic sector of Ontario industry where students find employment and need to understand the procedure required to manufacture sculptured surfaces.

Benefits of the Proposal (including number of department(s), courses and students affected):

All Mechanical students in ME 548, and students in design projects such as the mini-baja vehicle, the SAE formula and solar cars, aircraft model competitions, etc.

Cost Breakdown of Proposal (including partial funding options if desired):

MASTERCAM LEVEL 3 2-5 axis $14,785 20 site locations

The Department requests a 50% contribution and will provide the remaining funds from Alumni gifts.

25 - 40 students + student projects

Implementation Schedule for Project:

Spring 1997

Additional Information:

The current ICAM software is hardware protected with dongles. Unfortunately replacement dongles are no longer available from ICAM. A recent theft of a dongle has reduced the number of work stations available. In addition the software is obsolete or out-moded.

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Form

Fall 96

Proposal Title: MATERIALS TESTING MACHINE Email:

Submitted by: M. KAPTEIN Phone Number: 3026

Position (Student, Professor, Organization, etc.): DIRECTOR, MECHANICAL ENGINEERING LABS.

Description of Proposal:

Mechanical Engineerng students take two material science courses; ME 215 and ME 330. These courses have significant laboratory components. Essential for these courses and 4th year projects is a Material Testing Machine, for evaluating the strength and structure of metallic and non-metallic materials. We have to replace an Instron (Materials Testing Machine) which is 31 years old and can no longer be effectively maintained.

Benefits of the Proposal (including number of department(s), courses and students affected):

All ME students taking ME 215, ME 330 with an equivalent workload of 4 terms, ME 482 student projects. In addition, Civil Engineering has been using the Mechanical facilities, three terms a year, for CIV 265.

Cost Breakdown of Proposal (including partial funding options if desired):

We are requesting funding support of $6,000. WEEF has already donated $8,500 and the ME Department has obtained matching funds for this project for a total of $17,000. We require an additional $12,000 and request a further contribuiton of $6,000.

Implementation Schedule for Project:

Spring 1997

3 courses + proj.

Additional Information:

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Form

Fall 96

Proposal Title: STUDENT EQUIPMENT FOR STUDENT MACHINE SHOP Email:

Submitted by: M. KAPTEIN Phone Number: 3026

Position (Student, Professor, Organization, etc.): MANAGER, ENGINEERING MACHINE SHOP

Description of Proposal:

The student Machine Shop provides essential hands-on services for all undergraduate engineering students either for projects or core class courses. The shop is in need of a sheet metal punch.

Benefits of the Proposal (including number of department(s), courses and students affected):

All engineering students. Student Projects in all Engineering Departments.

Cost Breakdown of Proposal (including partial funding options if desired):

Poper Whitney Hand Bench Deep Throat Punch $2,125.

(Includes punches and dies).

The Engineering Machine Shop has no budget for this purpose.

{open from 8 30am - 9.30pm (Sat.) 10am - 5pm}

Implementation Schedule for Project:

Winter 1997

Additional Information:

Please note that this request is for the Student Shop and is not a Mechancial Engineering request.

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF FUNDING PROPOSALS FALL 1996
ENGINEERING COMPUTING
ESTIMATED EQUIPMENT COST

PRIORITY	LABORATORY /AREA	EQUIPMENT	$ AMOUNT	COURSES	STUDENTS / ANNUM
1	ENGINEERING WATSTAR LAB	**UPGRADE THE WHEEL& SHIM LAB**	**$4,288 + tax**	ALL ENGINEERING STUDENTS	5,505
	E2-1302B	1.1 GB HARD DRIVE	$268.00 per PC (16 machines)	All 1st yr students CIV E 403 M E 201 M E 203 All Eng students when lab is not reserved	
2	WEB SERVER for Student Web Pages	4.3 GB HARD DRIVE	$1,543 + tax	ALL ENGINEERING STUDENTS	5,505
TOTAL			$5,831		

Part Number	Warranty Months	Product Description	Unit Price	Total
HD-ST-3851A	36	Seagate ST-5108A IDE Hard Drive (1.1 GB 256K Cache, 10ms Mode 4)	$268	$4288.00
HD-ST-1515ON	60	Seagate ST-1515ON SCSI-s Hard Drive (4.3 GB 1MB Cache, 8ms)	$1545	$1545.00
		Total (pre tax)		$5833.00

WEEF FUNDING PROPOSAL FORM

Submitter Information:

Name: *Professor Beth Jewkes, Engineering Computing*
Phone Number: *885-1211 Ext: 4601*
E-mail Address: *emjewkes@mansci.watstar.uwaterloo.ca*
Position (ie student, professor): *Associate Dean for Computing*

Proposal Information:

Title: *Faculty of Engineering Undergraduate WATSTAR facility upgrades*
Date: *September 20, 1996*
Type (AE&R or non-AE&R): *A E & R (Academic, Equipment & Resources)*

Description (use the back of this page or additional paper if more space is required):

1. *Of the 29 PC computers in E2 1302B (Wedge & Shim labs), 16 do not have hard disks. Currently, all of the other 112 machines in the main Watstar labs (EL 108 - Helix, E2 - 1303 B (Wedge & Shim) and E2 - 1308 (Wheel)) have hard drives. The addition of these 16 additional drives will enhance the Windows operations by a factor of from 2 to 10 times. We are requesting the assistance of WEEF in the purchase of 16 1.1 GB hard drives to make this room compatible with the remainder of the Watstar rooms.*
2. *Faculty/Staff/Students in Engineering are (in increasing numbers) creating Web pages for course work, resumes and general administrative use. At present, we are converting a Dec machine to serve as a Web server but disk space is needed to ensure that all members of the Engineering community have ample space to create their Web information. We are requesting the assistance of WEEF in the purchase of a 4.3 GB hard drive for such purposes.*

Estimated Cost of proposal (please itemize where possible):

Quantity	*Description*	*Unit Price*	*Total Cost*
16	*1.1GB, 256 K Cache IDE Hard Drive*	*$268*	*$4,288*
1	*4.3 GB 1 MB Cache Hard Drive*	*$1545*	*$1545*
	TOTAL COST (Pre Tax)		*$5,833*

Would partial funding to the cost estimate provided above be acceptable? (Y or N) YES

Please list the potential beneflaicries of this proposal (cite courses if applicable, access and availability of the proposed purchases, etc):

1. *E2 - 1302 (Wheel & Shim Watstar Lab)*

- *It is one of the most heavily used PC labs in Engineering and is in constant demand by the students (see bookings in Appendix A)*
- *all undergraduate students using Microsoft Windows packages and other application software*
- *development of course work accessible to all students in Engineering via the Internet will be enhanced with the purchase of the Hard Disks*
- *multimedia applications which are becoming commonplace will demand the use of space on these hard drives*

2. *Hard drive for our Web Server*

- *students are continuously requesting space for the creation of their Web pages on a Web server*
- *faculty are increasingly using the Web to improve their course material presentation*
- *administrative staff are using the web to better inform the student body of the Engineering related activities.*

Thank you for your proposal. Please submit the original copy to the Endowment Director.

Submitter Signature: Beth Jewkes
Date: October 7/96

Department Approval

Every proposal must be reviewed by the appropriate Department Head. This is done to ensure that the departments are well informedand have the opportunity to voice their opinion about proposals being presented to the WEEF Funding Council. If you are unsure who the appropriate Departmental Head is for yopur proposal, please contact the Endowment Director.

The following section is to be completed by the appropriate Department Head.

Name: *Prof. Beth Jewkes*
Position: *Associate Dean for Computing*
Phone Ext:: *885-1211 Ext: 4601*

I **DO/DO NOT** (circle one) approve of the above proposal.

If this proposal has not been approved, please indicate the reasons below:

Department Head Signature: Beth Jewkes
Date: Oct-7/96

Web Server Proposal

E&CE Web Server Proposal

Components	Detail	Cost	
Pentium 133	PCI Bus	$779.00	
Linux Operating System	2.0.0	$0.00	
Network Card	Ethernet	$180.00	
Network Cabling		$100.00	
SCSI HD	9.1GB 1M Cache 11 ms Access	$2,827.00	
UPS		$190.00	
Tower Case		$100.00	
64 Meg Ram	72 Pin	$420.00	
CD Rom	4X	$101.00	
Total Cost		$4,697.00	10.45% Tax
Plus Applicable Taxes		$5,187.84	

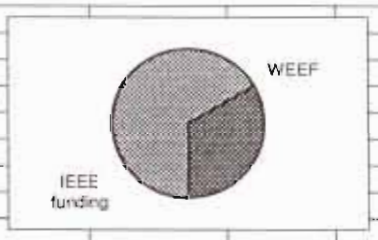
Benifits:

- § Distribution of Resumes
- § Learn HTML, Java.
- § Increases Visibility of Waterloo Engineering
- § More than 1500 Students Affected
- § Reduces Load on other Machines

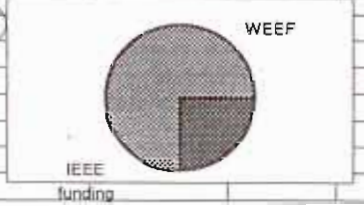
Funding Options:

5 Mg acct. for E&CE

Total Cost	$	5,187.84
WEEF	$	1,729.28
IEEE funding (1-2)	$	3,458.56



WEEF	$	1,296.96
IEEE funding (1-3)	$	3,890.88



WEEF Proposal Form

Fall 96

Proposal Title: E+CE Web Server Email: adhellem@novice

Submitted by: Aaron Helleman Phone Number: 884-9297

Position (Student, Professor, Organization, etc.): Student

Description of Proposal:

Purchase a Web server for the E+CE department, student accounts with at least 5 Meg accounts for the entire 5 years + 1 grad year. Approx 2000 Accounts @ 5 Meg = ~~[illegible]~~ 10 Gig.

We need student accounts on a engineering machine, not a Computer Science Club account. Waterloo is a technologically advanced engineering school, and engineers should have own pages.

Benefits of the Proposal (including number of department(s), courses and students affected):

Distribution of Resume's, learn HTML, java, ect. skills necessary in today's job market. When successful, other Departments may choose to copy our system. 1500 students affected, with the possibility of all engineers. Takes load off of SUNEE — overloaded server. Increases visibility of Waterloo Engineering

Cost Breakdown of Proposal (including partial funding options if desired):

JKL CATALOG PRICES

Pentium 133 running LINUX (Free)	PCI BUS	- #779
Network Cards	~200	+16 keyboard
Network Cabling		~200
SCSI HD —	2.6G x 450 x 4 (10.9 Gig)	~1800
UPS.		~200
Big Power Supply + Tower Case		~150
64 Meg Ram		+420
		$3765

+12% tax

$4216.80

Implementation Schedule for Project:

A.S.A.P. - Implementation to be done by Students with some help from staff.

Additional Information:

A more detailed proposal will be defended. I am meeting with the IEEE to see if they will cover some of the costs as well.

1500 students(?)

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Form

Fall 96

Currently 1 comp. in the 4th yr room

Proposal Title: Watstar PCs for 4th year EECE Room Email: rwhackba@elecom2.watstar

Submitted by: Randy Hackbart Phone Number: 886-8917

Position (Student, Professor, Organization, etc.): Student

Description of Proposal:

- 2 complete computer systems for 4th year EECE room, E2 3352
  - Pentium 133 MHz, PCI bus
  - 32 MByte EDO RAM
  - ATI 2MByte Mach 64 PCI video card
  - 2 GByte HD
  - 15" Monitor
- Cost: $2500 each → $5000 total

Benefits of the Proposal (including number of department(s), courses and students affected):

- 4th year students (200/term max.) will use these systems, and reduce congestion in the public Watstar rooms
- Courses: EECE 413, 427, 437, 439, 443, 446, 450, 471, 481, 482, 485, 486
- Applications: Matlab, Visual C++, Maple, MathCad, X-windows emulation
- Department will match WEEF's funding with up to two additional PCs.

Cost Breakdown of Proposal (including partial funding options if desired):

- EECE department will match funding (possibility of four systems total)
- Will accept partial funding for 1 system.

Buy 1 get 1 free

Implementation Schedule for Project:

As soon as possible.

Additional Information:

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Form

Fall 96

Proposal Title: Hard disks for E&CE 4th year terminal room Email: jpmclena@ece.uwaterloo.ca

Submitted by: James McLenaghan Phone Number: 884-0670

Position (Student, Professor, Organization, etc.): Student

Description of Proposal:

Purchase and installation of 1.6 GByte hard drives into Watstar PCs in E&CE 4th year terminal room (E2 2365). This will allow creation of local MADs (Massive Application Disks) resulting in vastly improved performance. Thus, more students will use the PCs which are otherwise very well equipped, and reduce congestion in the other public access Watstar rooms.

Benefits of the Proposal (including number of department(s), courses and students affected):

See above.

200/term (max) for all 4th year E&CE courses

Cost Breakdown of Proposal (including partial funding options if desired):

4 Seagate ST-31640A IDE/ATA 1.6 GByte HDs @$400 w/ tax.

Total: $1600

Will accept partial funding in increments of $400.

Implementation Schedule for Project:

As soon as possible (Jan. '97)

Additional Information:

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Form

Fall 96

Proposal Title: _____ Email: DCDICKSO@BRIDGE

Submitted by: Darren Dickson Phone Number: 884-7533

Position (Student, Professor, Organization, etc.): Student

Description of Proposal:

Request for computers for fourth-year civil room.

Benefits of the Proposal (including number of department(s), courses and students affected):

Provide DATASTAR access to students in 4th Yr Civil room. Access to 100+ students in Civil Engineering

Cost Breakdown of Proposal (including partial funding options if desired):

see attached sheet

Implementation Schedule for Project:

- purchase & install by X-mas pending computer services approval

Additional Information:

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal

System 1 would contain:			
	P100, with 4 PCI slots, Triton, 256K pipeline burst cache	$642	
	3.5" Floppy Drive	$30	
	1.1G Hard Drive	$268	
	Mouse	$33	
	16 Mb RAM	$64	
	14" Monitor	$329	
	64bit Video Card	$105	
Total			**$1,471**
System 2 would additionally have:			
	15" Monitor	$455	
	Accelerated Video Card	$380	
	4x CD ROM	$74	
	32 Mb RAM	$210	
	Fax/Modem	$68	
Total			**$2,160**

Options for Purchase:

Option #1

	3 of System 1 @ 1471	$4,413	
	1 of System 2 @ 2160	$2,160	
Subtotal			**$6,573**
	GST+PST	$986	
Total			**$7,559**

Option #2

	1 of System 1 @ 1471	$1,471	
	1 of System 2 @ 2160	$2,160	
Subtotal			**$3,631**
	GST+PST	$545	
Total			**$4,176**

Option #3

	2 of System 1 @ 1471	$2,942	
Subtotal			**$2,942**
	GST+PST	$441	
Total			**$3,383**

WEEF Proposal Form

Fall 96

Proposal Title: New keyboards Email: dhdamner@chemical

Submitted by: David Damner Phone Number: 748-0079

Position (Student, Professor, Organization, etc.): Student

Description of Proposal:

new keyboards for chemical Engineering computer lab

Benefits of the Proposal (including number of department(s), courses and students affected):

Keyboards right now are terrible. This would benefit 2, 3, 4 year chemical engineers.

Cost Breakdown of Proposal (including partial funding options if desired):

E1 → 2nd floor

8 computers ⇒ 6 needed badly

$15-20 / keyboard

= $120-160 total spending or $90-120 alternate spending

need to get University price check

Implementation Schedule for Project:

Anytime

Additional Information:

Please submit to WEEF mailbox in the Orifice by November 1st 96.

Funding Proposal
Presented to the University of Waterloo WEEF

Proposal Summary

Project Title:	Presentation on the Current Technical and Economic Situation of Wind Energy Technologies in Canada	
Contacts:	David Elzinga	[dcelzing@mechanical]
	Hans Oberholzer	[joberhol@mechanical]
	4A Mechanical Engineering	579-2198
	University of Waterloo	
Date:	November 26, 1996	
Location:	University of Waterloo, Waterloo, Ontario	
Total Costs:	$1245.00	
Funds Requested:	**$200.00**	

Objectives:

- To promote renewable energy technologies
- To present to the student community the latest technical innovations, as well as outstanding technological challenges, in the field of wind energy conversion.
- To bring to the student community an awareness of the current state of the wind energy conversion business in Canada and, by extension, in the world.
- To provide both the student community and WPIRG with the most up to date written material on wind energy in Canada found at the 1996 Canadian Wind Energy Conference Trade Show.
- To submit a written report containing the information given in the presentation to the WPIRG resource center and other interested parties.

Background

With the advent of the worldwide depletion of fossil fuel supplies, and the ever increasing material consumption rate, a need emerges to restructure our practices in energy consumption and generation. This need has already been addressed in part at the technological and policy-making level. Solutions will have to originate from long and short term thinking, encompassing such factors as the environment, and local and global economies.

Renewable energy conversion technologies such as solar power, bio-mass, and wind power offer certain characteristics which would make them attractive within a future energy generation scheme. For one thing, they are non-polluting. They are also driven, directly or indirectly, by an abundant source of energy, the sun. Their application has existed for centuries but it is only recently that their presence seems needed more than ever. Wind power is increasingly appearing on the agenda of local and regional utilities in the United States and Canada.

The authors of this proposal are currently starting a business in the field of renewable energy conversion. At present they are working on a design project involving wind turbines. In addition to their business goals they have established a mandate to inform the technical community and the community at large about the importance and future role of renewable energy technologies. The presentation being prepared for the University of Waterloo student community is the first step in this direction.

Needs Assessment

The need for a presentation on the current economic and technical situation of wind energy technologies has arisen in response to a current void in the University of Waterloo community. Little work is being done at the University of Waterloo which deals with wind energy conversion. Moreover, the topic does not appear on the agenda of any student organizations. This presentation will be given as part of the Student Society of Mechanical Engineers' agenda, and will be a distinct addition to the list of technical seminars already scheduled for this term.

In addition, it is hoped that the presentation will inspire other students to contribute to the evolving knowledge base of the University, and will promote an entrepreneurial spirit within the student body.

The preparation for the presentation will heavily rely on information gathered at the 1996 Canadian Wind Energy Conference (see enclosed copy of the Conference pamphlet). In addition to providing the authors with an environment in which to explore business opportunities, the conference has also served as a key source of information for the most up-to-date presentation material.

Budget

Conference:	
Entry fees:	$ 210.00
Air fares:	$ 650.00
Other Traveling Expenses:	$ 150.00
Overnight expenses:	$ 65.00
Meals:	$ 120.00
Other:	
Photography:	$ 30.00
Photocopying:	$ 10.00
Preparation:	$ 10.00
Total:	$1245.00
Funds Requested:	**$ 200.00**
Percent of total cost:	**16 %**

Conference was attended in October '96

DESIGN PROPOSAL
1997 University of Waterloo CASI Free Flight Glider Team

BACKGROUND:

In May 1996, the Southern Alberta Institute of Technology in Calgary hosted the third annual free flight glider competition sponsored by the Canadian Aeronautics and Space Institute (CASI). A group of eight students from various faculties at the University of Waterloo designed and built a glider which was the University's inaugural entry in this competition. We finished in third place, and we won the 'Top Gun' award for the 'Best Unexpected Arrival.' Next May we will be entering the competition for the second time. We are looking for sponsorship to help us continue the design and construction process for our entry into the 1997 competition.

COMPETITION:

The competition consists of three parts: a written report, a presentation, and two days of flight trials. Each of these components independently contributes to the team's final score. At the end of the competition the team with the highest score overall wins. Teams with the best report, presentation and flight score are also recognized. The flight tests contribute the largest amount to the final score. Scoring for the flight aspect comes from an equation based on the amount of payload carried and the duration of uncontrolled flight. Each design is brought to an altitude of 50 metres by a tow line. Once the tow line is released the timing begins, to a maximum of 75 seconds. During this period of flight the glider is uncontrolled and must circle in a specified area.

DESIGN:

We are currently considering two design options for our entry; the first being a standard glider with a wingspan of approximately 2½ metres, the second design resembling a flying wing shape. We are currently looking into the required aerodynamic properties for both glider designs and composite materials to strengthen the glider to allow for repeated flights. The team is pursuing computer modelling such as computational fluid dynamics and finite element analysis to help us verify our designs. We will also be wind tunnel testing both designs. We are attempting the unique and challenging flying wing design this year because we would like to enter an unconventional design into the competition. All the designs of previous years were very alike. We would like to be the first team to try something new to expand the scope and challenge of the competition. We feel that even though flying wing airplanes are inherently unstable, the lifting body design will be very effective in the competition.

LEVEL OF DEVELOPMENT:

Our team is busy performing research on the aerodynamic properties of the flying wing design. We are also studying the previous glider design for improvements which can be adopted for the 1997 glider designs. We have also started to research new materials which are available to us. The 1996 glider was constructed from balsa wood with a thin plastic covering. We plan on featuring advanced composite materials such as kevlar and carbon fibre construction with a mylar or nylon covering for the 1997 glider. We are studying the properties of these materials to determine which are suitable for our application and the best usage of each.

SPONSORSHIP:

Our team is seeking financial sponsorship to allow us to compete in the 1997 glider competition. We have developed a tiered system of sponsorship levels, which allows us to recognize our sponsors in a fair manner. Our tiered system is as follows:

Sponsor Level	Amount of Sponsorship
Platinum Level	$900 and above
Gold Level	$650 to $899
Silver Level	$350 to $649
Bronze Level	Below $350

We appreciate any financial support that you can give us. In return for your sponsorship we will be sending a package to you which includes the following items:

For all Bronze sponsors:

An income tax receipt,
A picture of the team and the glider,
Your company logo on the glider,
A collage of pictures from the competition

For all Silver sponsors:

The above mentioned items plus:
Your company logo on the team T-shirts,
A picture featuring your company logo on the glider,
Your company name will be mentioned in any newspaper article written by the group

For all Gold Level sponsors:

The items for Bronze and Silver plus:
Your company name on the UW CASI web site,
Your company logo on any flyers or advertising,
A copy of the report submitted to the competition

For all Platinum sponsors:

All of the above mentioned items plus:
The glider can be loaned to your company after the competition for a period of time subject to certain conditions,
A team T-shirt

When the company logos are placed on the posters, T-shirts or the glider itself the size of the logo will be determined by the amount of available space and the sponsor's level.

BUDGET:

The projected cost of the full project is between $5,000 to $10,000. We are not able to give a full breakdown at this time because we do not know where the competition will be held this year.

Our projected cost breakdown is as follows:

Materials for Prototypes, Final Glider:			
Glue, Epoxy:	$300	Balsa, Bass wood:	$150
Styrofoam for prototypes:	$500	Nylon covering:	$250
Sheet metal:	$75	Kelvar sheet covering:	$200
Fibreglass:	$600	Carbon fibre covering:	$500
Practice Glider:			
Practice Glider:	$200	Thermal covering:	$150
Glider Control Equipment:			
Radio Control Pack, Servos:	$650	Gyros, Accelerometers:	$300
RC Pack spare battery:	$50	Hinges, Fixtures:	$80
Tools			
Foam Cutting Power Supply:	$50	Consumables:	$400
Field Tools	$400	Dremmel Tool:	$150
Transportation:			
To be determined once the location of the competition is set			

Please feel free to contact us through Gregory Thompson or Rob Ripley at (519) 886-7950. We can be reached by e-mail at g2thomps@mechanical.watstar.uwaterloo.ca or rcripley@novice.uwaterloo.ca. Please address any correspondance to UW CASI Freeflight Glider Team. Our address is 175 Weber Street North, Waterloo, N2J 3H3. Thank you for taking the time to review our request.

Sincerely,

Gregory Thompson
Project Manager

Robert Ripley
Project Manager

on behalf of the University of Waterloo
1997 CASI Free Flight Glider Team

WEEF Proposal Form

Fall 96

Proposal Title: 1997 CASI Freeflight Glider Team Email: g2thomps@mechanical

Submitted by: Greg Thompson Phone Number: 886-7950

Position (Student, Professor, Organization, etc.): Mechanical Engineering Student.

20 students
16 engg

Description of Proposal:

The 1997 glider team is looking for funding to allow us to continue the development of our entry into the 1997 freeflight competition. We are looking for tools which can be taken to the competition and used for field repairs (cordless) and a RC pack with low weight servos. From our experience in last years competition composite materials are a must for survivability and a successful entry. All the tools and RC pack will be assests to the team and used in subsequent competitions.

Benefits of the Proposal (including number of department(s), courses and students affected):

Currently, 20 UW students (16 in Engineering) are involved with the project. The competition is Canada wide and is sponsored by CASI. Entering the competition will get UW recognition and the possibility to host the competition in the future. Many corporations sponsor the competition or become involved in the competition.

Cost Breakdown of Proposal (including partial funding options if desired):

Please see attached sheet for full breakdown.

Total request	$2350
Option A	$1600
Option B	$1050
Option C	$800

Implementation Schedule for Project:

R&D is continuing. Construction of prototypes has begun and the practice glider is well underway. Material testing is progressing. A finished flying prototype is desired by the end of the term. This prototype will reflect the final design.

Additional Information:

The freeflight competition is an annual competition for universities across Canada. This will be the second entry into the competition for UW. In May of 96 with funding from WEEF we travelled to Calgary and placed 3rd. From our experience in the competition and flight testing a composite glider is a must. We are currently looking into a composite flying wing design. We have already built and flight tested a flying wing mockup which demonstrated stable flight over short distances.

Please submit to WEEF mailbox in the Orifice by November 1st 96.

Cost Breakdown.

Tools / Equipment:

Dremmel tool (cordless)	$150
Radio Control (RC) and slim line servos.	$650
Field tools	$250
Gyroscope and accelerometers	$300
	$1350

Materials.:

Epoxy	$150
Fibreglass	$250
Carbon fibre	$200
Kevlar	$100
Foam	$300
	$1000
Total	$2350

Partial Funding Options.

A: RC pack, servos $650
Epoxy $150
Fibre glass $250
Foam $300
Field tools $250
$1600

B: RC pack $650
Epoxy $150
Fibreglass $250
$1050

C: RC pack $650
Epoxy $150
$800

WEEF Proposal Form

Fall 96

Proposal Title: "ASME Regional Student Conference" Email: md3griff@mechanical

Submitted by: Student Society for Mechanical Engineers Phone Number: 743-6991

Position (Student, Professor, Organization, etc.): Organization / Student Chapter

Description of Proposal:

On April 3-5, 1997, the American Society for Mechanical Engineer Region V, is holding its Regional Student Conference and Region Student Leadership Seminar. In Cincinnati, Ohio. We, as the University of Waterloo's student chapter of the ASME, would like to send 20 students to represent our school at the conference + participate in the Leadership seminar.

Benefits of the Proposal (including number of department(s), courses and students affected):

20 students from the dept of Mech Eng will participate and benefit directly from the Conference. They will learn strong leadership skills, participate in competitions, exchange ideas and observe Mechanical Engineering In Action. Because of this exposure, these student will have the potential to increase their academic and extracurricular achievements as well as themselves as persons.

Cost Breakdown of Proposal (including partial funding options if desired):

Registration fee	- $150 x 20 students	=	$3000
Cost to students attending	- $40 x 20 Students	=	- $800
Transportation - Rental	- $100 x 4 vans	=	$400
- Gas	- $100 x 4 vans	=	$400
Shirts for Promotional Purposes	- $10 x 20 Students	=	$200
	TOTAL	=	$3200

Partial Funding proposal = $160/student. for as many as possible.

Implementation Schedule for Project:

Money by March 1st, 1997, Shirts + Transportation arranged by March 10/97
Depart: Apr. 3 (AM) Return Apr. 5 (PM)

Additional Information:

Last Years conference was in Toronto. Due to limited funds, we were only able to send 2 students. This was very disappointing since our school is only an hour away. Other schools from as far away as West Virginia Sent 10 - 30 students. We would like to improve this and give a strong representation of our school.
We are also approaching companies and the Dept of Mech Eng for funds.

Please submit to WEEF mailbox in the Orifice by November 1st 96.

WEEF Proposal Fall 96 Submitted November 1 ,1996

Experimental Jet Engine Lab (E-JEL)

(undergraduate design project)

e-mail :mkbrewst@zeus
eplumis@mechanical
gdloney@mechanical

E-JEL Principal Design Group
(student organization)

Tel. Michael Brewster
(519) 746 - 2596
(519) 241 - 2009

Description of Proposal: (general overview)

E-JEL is a student initiated project aimed at creating and operating a fully functional "Jet Engine lab". The focal point of this lab is a **modular 300 lb (thrust) turbo jet engine**. The engine is to be specially designed and configured for instrumented propulsion, combustion and fluid dynamic analysis (computer controlled operation and data acquisition).

Phase I: (Complete)
Feasibility assessment, Corporate/Industrial/ Faculty and Student interest survey, partial intake construction.

Nov 96 Proposal Description:

Phase II:
Combustion chamber prototype materials, P.R. materials and publishing (for government and corporate sponsors), Technical reference materials.

The E-JEL project has consolidated a student design group and serious outside interest. Our goal in Phase II is to provide our potential sponsors with a detailed technical proposal and a critical path analysis. This process requires us to prototype a few central elements in the combustion chamber.

Benefits of E-JEL:

The construction and operation of the experimental jet engine lab by the undergraduate student body provides several immediate and long term benefits:

- E-JEL is potentially an excellent platform for 3rd and 4th year academic projects.
- Interdepartmental involvement (Mechanical, Systems, Electrical and Computer)

- Courses with relevance and project potential:

ME 322 -Mechanical Design 1
ME 423 -Mechanical Design 2
ME 360 -Introduction to Control Systems
ME 354/SY DE 381 Thermodynamics 2
ME 456 -Heat transfer 2
ME 482 -mechanical Engineering Project

ME 557 -Combustion 1
ME 563 -Turbomachines
ME 362 -Fluid Mechanics 2
ME 566 -Fluid Mechanics 3
ME 569 -Fluid Mechanics Design Topics

SY DE 382- Modelling and simulation
SY DE 454- Computer Simulation of Systems/Modelling of continuum Systems

E&CE 354 -Real Time operating Systems
E&CE 485 -Computer Control Application
E&CE 455 -Software Engineering
E&CE 485 -Computer control applications
E&CE 499 A/B Project

- Opens new research opportunities to undergraduates
- Provides an avenue for application of theory learned in courses (student directed education)
- Students interested in applied research engineering can develop experimental engineering design scope
- A long term continually operating project provides a unique environment for industrial and institutional sponsors in the UW community.

Cost Breakdown of Proposal: (Phase II only)

▲ Technical reference material (Lexicon Aviation)	$ 350.00
▲ Testing samples of combustion chamber materials (Inconel® /High temperature sole proprietor metals)	$1000.00
▲ P.R. materials and information package publishing	$ 50.00
	$1400.00

Implementation Schedule for Project: (Phase II)

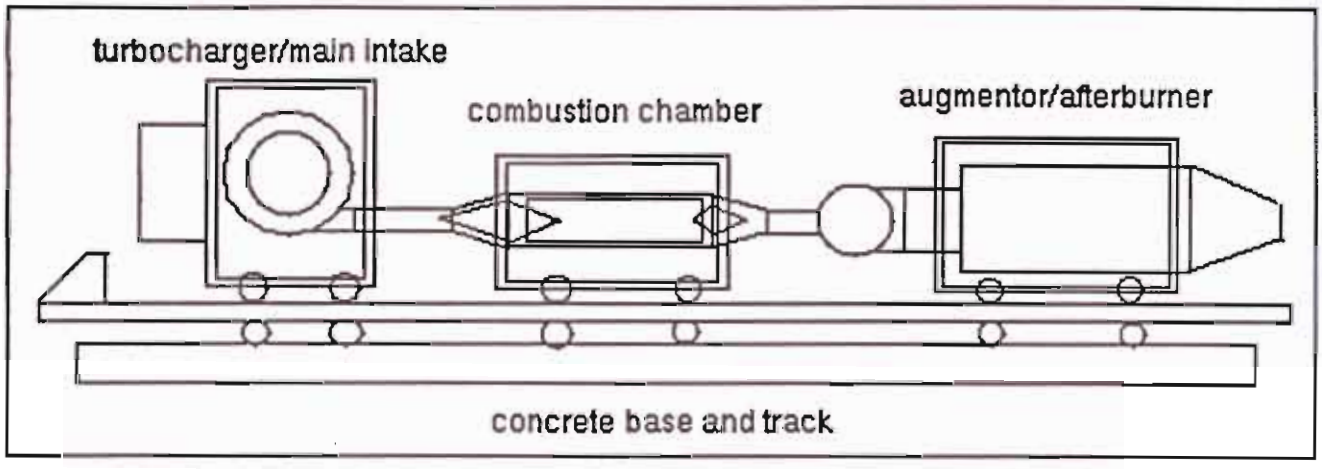
Phase II is targeted to be completed by January 31, 1997. This coincides with our interested sponsors confirmation dates.

E-JEL is scheduled for 18 months of design and 12 months of construction, with a 4 month overlap between phases. Testing and operation is targeted to commence Winter 1998-99, with an indefinite operating life.

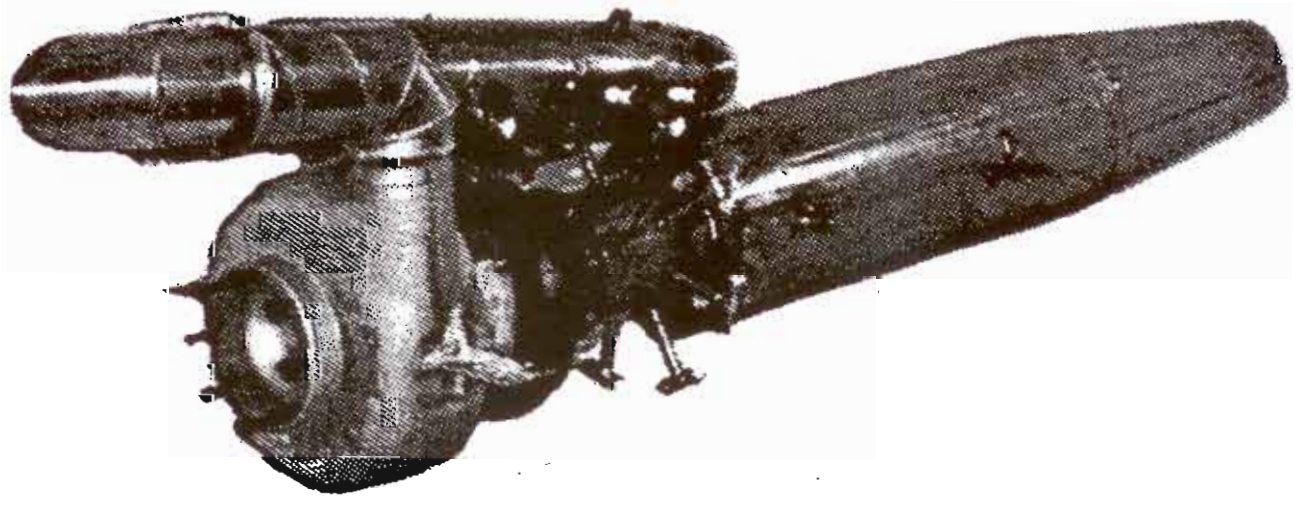
WEEF Proposal Fall 96

Submitted November 1st. 1996

Conceptual Diagram: (experimental configuration)



Design Basis:
Operationally configured TRJ-300 "Lexicon"
- **Drone Missile, EAA experimental aviation application**



WEEF Proposal Form

Fall 96

Proposal Title: Mini Baja 97 Email: sppeplin@mechanical

Submitted by: Steven Peplinski Phone Number: 885-2639

Position (Student, Professor, Organization, etc.): Mini Baja Co-Captain

Description of Proposal:

The SAE Mini Baja competition involves designing and constructing a single seat off-road vehicle. The University of Waterloo has been competing for many years and is always competitive with several top 10 finishes. The 1997 competition will be held at Dayton, Ohio near the end of May.

Benefits of the Proposal (including number of department(s), courses and students affected):

The 1997 team includes 25 team members from 1st to 4 yr with 3 different departments being represented (mechanical, civil and systems). Work on the car has ~~been~~ given students credit for both ME 482 and ME 321.

Cost Breakdown of Proposal (including partial funding options if desired):

frame welding 50 hr @ 14.50	= 725
2 Eaton hydraulic motors @ 250 ea	= 500
2 new front rims + tires	260
2 new rear rims + tires	280
new seat and seat cover	200
	$1965 cdn

option #2

Implementation Schedule for Project:

Frame and drivetrain design is now complete, funding is required ~~at~~ to allow immediate construction

Additional Information:

By re-using many suspension, braking and steering components, overall cost of the car will be kept down. The funds recieved by WEEF will allow replacement of damaged components with light weight high performance replacements. This should greatly improve performance of the vehicle.

Please submit to WEEF mailbox in the Orifice by November 1st 96.

26 members this stream + offstream

WEEF Proposal Form

Fall 96

Proposal Title: SNOW WARRIOR Email: jwdietz@bridge

Submitted by: JEFF DIETZ Phone Number: 886-6255 4th year Civ room

Position (Student, Professor, Organization, etc.): STUDENT

Description of Proposal:

Snow Warrior is the engineering A stream entry into the Great Northern Concrete Toboggan Race to be held at Ottawa in Feb. 1997. Competing in the GNCTR involves designing and constructing a toboggan with a concrete running surface and mechanical braking system. The toboggan will be taken to Ottawa to compete on a 400 metre snow covered course. The Snow Warrior team has been working since Jan 1996 on design and fundraising

Benefits of the Proposal (including number of department(s), courses and students affected):

The snow warrior team is comprised of 35 4th year civil engineering students. Participating in the event increases the reputation of the University of Waterloo Engineering Faculty. Past entries have done very well including a first place finish by Waterluge in 1995. Team members increase their team work skills and gain an outlet to practice some of the skills learned in the classroom.

Cost Breakdown of Proposal (including partial funding options if desired):

Priority ↓

	Cost	Request
Accomodation	$4500	$1000
Entrance Fee	$2650	$900
Uniforms	$1600	$600
Construction	$2000	$500
Technical Display (12'x8')	$400	$400
		$3400

Any partial funding would be acceptable

Implementation Schedule for Project:

Design, Fundraising and Construction teams are currently at work. The race is in February 1997.

Additional Information:

Further details will be provided and any questions answered by the Snow Warrior representative at the WEEF presentation. With Snow Warrior being such a large team we hope team size will be a factor in distribution of WEEF funds.

Please submit to WEEF mailbox in the Orifice by November 1st 96.

UNIVERSITY OF WATERLOO
MIDNIGHT SUN
SOLAR RACE TEAM

Proposal Title: Maximum Power Point Trackers for the Midnight Sun Solar Race Car
Submitted by: Gregory Bridgett - Project Manager **Phone Number**: x2978

Description of Proposal:
The AERL MPPT is a power transformer that is used to optimise solar array performance under adverse conditions. These devices typically add 20-30% to the solar array output, which translates to a definite requirement for the design of any solar-powered race car. They work by sensing the performance of the array connected to it and adjust the array voltage to find the optimum point on the cell's I-V curve (more power!).

The Midnight Sun team used two of these units for the 1995 car. Because of the increased complexity of the MSIV design, we will be requiring an additional four units that will used in conjunction with the trackers to be re-used from MSIII.

Benefits of the Proposal:
The Midnight Sun Solar Car Project involves over 100 students from **all** departments of Engineering, as well as from numerous other university faculties (Science, Math/CS, Arts). The purchase of these MPPTs will enhance the overall design and performance of the solar car and thus the standing of UW in upcoming Canadian and American races. As well, the MPPTs will not become obsolete since they already perform above 99% efficiency and are over-rated for the application. It is expected that future cars will be able to use these parts, giving them a potentially long lifetime.

Cost Breakdown of the Proposal:
Each unit costs US$600 (approx. CDN$800 at current exchange rates). Including shipping and taxes, we are requesting ~~$3500~~ $3000 $750 2250.

Partial funding could be given for the purchase of only three of these units for ~~$2600~~. Since the MSIII team had purchased a spare and we require a total of six MPPTs, we have an immediate requirement for the purchase of only three units. However, at least one spare will be required in case of failure.

Implementation Schedule for the Project:
When WEEF provides the commitment for funding the units, they will be purchased from AERL in Australia. Upon completion of the solar array construction, the trackers will be integrated into the high voltage system of the vehicle and tested. This will occur in the spring of 1997.

check NEW proposal form

WEEF Proposal Form

Fall 96

Proposal Title: Team PROPeh?NE - Propane Vehicle Challenge Email: pvc@sail.uwaterloo.ca

Submitted by: Ross Nairn Phone Number: (519)-886-6922

Position (Student, Professor, Organization, etc.): 4th year mech. eng. student

Description of Proposal:

Team PROPeh?NE requires several pieces of equipment to assist in converting the vehicle for the 1997 Propane Vehicle competition. These items include a laptop computer, a vehicle hoist, data acquisition components, and a portable gas analyzer. Details and the need for this equipment is explained on the attached page. The total financial value of this equipment is $8500, but the items are independent of each other.

Benefits of the Proposal (including number of department(s), courses and students affected):

The scope of this project crosses into several departments: Mechanical, Systems Design, Electrical, and Chemical. Students from all years are encouraged to become involved. Currently, there are 4 faculty advisors, 6 main team members (students in 4th year project courses), and 5 students from various years and faculties actively involved. These numbers are increasing as recruiting progresses. It is anticipated that the project will continue in years to come, benefiting future students. The equipment required will be made available to other project as well, such as Formula SAE, Mini-Baja, and Midnight Sun. All teams could greatly benefit from this equipment.

This equipment is intended to strengthen Engineering's infrastructure. It will be used for this year's projects, and will be available for the projects of years come.

Cost Breakdown of Proposal (including partial funding options if desired):

These items, listed in order of priority, are independent of each other. Partial support for purchasing these required pieces of equipment is also a possibility. The cost breakdown is:

Priority

(3)	Laptop Computer	$2000
(1)	Vehicle Hoist:	$2000
(4)	Data Acq. Components	$1500
(2)	Gas Analyzer:	$3000

Note that the Gas Analyzer actually costs $6000. It is proposed that half of the cost ($3000) be covered in Fall, 1996, and the remaining half in Winter, 1997.

Implementation Schedule for Project:

The competition is to be held in Texas, U.S.A. in May, 1997. Extensive testing for this project is required, so it is the goal of the team to have the truck running before the end of 1996, and optimized by the start of April, 1997. All of the above equipment would be put to use immediately.

Total Budget $60,000

Additional Information:

See attached page.

12 people

Team PROPeh?NE WEEF Proposal - Additional Information

Background Information

The Propane Vehicle Challenge is a 6-day competition between North American colleges and universities to implement the best dedicated propane conversion, based on emissions, performance and overall vehicle efficiency. Team PROPeh?NE is one of only two Canadian entries into the Pickup Category for this competition, of eight total entries.

This is University of Waterloo's first year in this particular student competition. Strategic alliances already formed with several companies in the propane vehicle industry gives Team PROPeh?NE a strong basis for putting together a winning conversion. Since the competition is to be held in Austin, Texas, in May of 1997, the time scale of the project is short, and rewards will be almost immediate.

The competition is sponsored by Chrysler Corporation, U.S. Department of Energy, and Natural Resources Canada. The conversion vehicle for the Pickup Category is a 1995 Dodge Dakota Pickup, delivered new, without a fuel system. It is anticipated that the Dakota here at Waterloo will be used in future years for additional competitions and other research activities.

Justification for Equipment

Laptop Computer:

Campbell Scientific Inc. has generously lent Team PROPeh?NE one of their top data acquisition systems. To utilize this system, a laptop computer is required for testing of the vehicle. This vehicle competition is quite different from many other student projects - the design goal is to implement a fuel conversion strategy which could be used, as is, in today's market. To ensure that Waterloo's entry meet this criteria, extensive testing and data analysis will be required. The laptop would be used in the collection and analysis of the data.

Vehicle Hoist:

Since the conversion to propane fuel is intended to be invisible to the average consumer, a great deal of engineering work will be done underneath the vehicle. For example, the propane fuel tanks must be fitted underneath the bed of the pickup, and the fuel delivery system must be located safely in the engine compartment. Modifications to the exhaust headers, catalytic converter and muffler system are also anticipated. A vehicle hoist is required to do the vast majority of this work, and could be located in Team PROPeh?NE's workspace.

Data Acquisition Components:

As mentioned above, the use of a data acquisition system has been donated to the university for this project. However, in conjunction with this system, additional third party components are required. Devices such as flow meters, pressure transducers, and thermocouples are required to accurately gauge the effectiveness of Team PROPeh?NE's conversion. The cost of $1500 will go towards acquiring these components.

Portable Gas Analyzer:

Heavy emphasis in the competition is placed upon having the lowest possible emissions throughout the driving cycle. Since the university does not have a chassis dynomometer, or a gas analyzer, the easiest and most efficient method for determining the truck's emissions is to acquire a portable gas analyzer for use in the truck while road testing. Due to the high cost of this lab equipment, it is proposed that the cost be split over two terms. This equipment would become an integral part of all internal combustion research that occurs at the university.

WEEF Proposal Form

FALL 96

Proposal Title: Formula SAE '97

Submitted by: Albert Tseng Phone Number: ext.5904

Position (Student, Professor, Organization, etc.): Formula SAE 97

Description of Proposal:

Formula SAE is an annual design competition contested by approximately 100 universities from around the world. U of Waterloo has competed since 1987 and has done as well as fourth overall. Although the 1996 Team was disappointed with their top third of field finish this May, they were very successful, setting the fastest lap time for the main event. Equipped with the knowledge gained from the 1996 team, the 1997 team has set a goal of a top five place overall finish in next year's competition.

Benefits of the Proposal (including number of department(s) and students affected):

In previous years, each car has been taken apart for parts for the new car. One of the objectives of the 1997 team is to gather enough funds to keep the 1996 car intact. This would be beneficial for both the Formula SAE Program and the Faculty of Engineering. For the Formula SAE program, students will be able to learn from the '96 car, test new ideas, perform driver training, and promote the vehicle for sponsorship. For the Faculty of Engineering, the Formula SAE car represents one of the best public awareness tools available. The fully intact car has already been displayed at many events including the Kitchener/Waterloo Canada Day Celebrations where many elementary and high school students have asked questions about the car and the Engineering Program at U of Waterloo. Most of the successful US schools at the competition have a very strong history at the competition because of their ability to keep each car and thus learn from them and also attract the brightest students to their university.

There are 25 undergraduate engineering students from most of the engineering disciplines involved with the 1997 Formula SAE Team These include 2nd to 4th year Mechanical, Civil, Electrical and Chemical engineering students.

Cost Breakdown of Proposal (including partial funding options if desired):

The attached sheet lists the items which will be used on the 1997 car in order to keep the 1996 car intact as well as some tools (which can be used in future years as well) necessary to build the vehicle.

Implementation Schedule for Project:

All parts will be purchased immediately and will be used in fabrication in the Fall.

Additional Information:

The ability to learn from past cars is a definite advantage at the competition as shown by the successful schools. Every effort should be made to keep previous cars intact to help the University of Waterloo excel even further at the competition and at the same time gain recognition for the Faculty of Engineering.

Please submit to WEEF mailbox in the Orifice by November 1st, 1996.

40 students

Parts Required to Build the Car

Item	Qty	Cost ($US) Each	Cost ($CAN) Total
Fuel Pump	1	$244.20	$341.88
Battery	1	$70.39	$98.55
Rod Ends	1	$549.80	$769.72
Master Cylinders	2	$53.57	$150.00
Headers (Exhaust Manifold)	2	-	$800.00
Steering Wheel	1	$69.41	$97.17
Cooling Fans	2	$39.95	$111.86
Mirrors	2	$14.95	$41.86
		Total	$2,411.04

Tools

Item	Qty	Cost ($US) Each	Cost ($CAN) Total
3/8" Ratchet	1	-	$28.75
Socket Drive Adapters	1	-	$19.54
Screwdrivers	1	-	$25.29
Rubber Mallet	1	-	$11.49
12V Cordless Drill	1	-	$300.00
Rivet Gun	1	-	$30.00
Pyrometer Tire Probe	1	$39.95	$55.93
Pyrometer Surface Probe	1	$39.95	$55.93
		Total	$471.00

Other

Item	Qty	Cost ($CAN) Total
Answering Machine	1	$75.00
	Total	$75.00

Grand Total $2,957.04

budget ~~$ 35,000~~ '96 $3250 / term

[- no parts carry over] 1/3 of $$$

WEEF Proposal Form

Fall '96

Proposal Title: UW Aero '97 Heavy Lift Aircraft
Submitted By: Kyle Schmidt (rkschmid@novice) **Phone Number:** 746-9887
Position: 4A Mechanical Student (Aero '97 Team Manager)

Description of Proposal:

The UW Aero '97 team is a senior mechanical engineering team organized to compete in the 1997 SAE Aero design competition. The goal of the competition is to design, build, and fly a radio controlled cargo aircraft in competition with university teams from around the globe. In order to design and test a radio controlled aircraft, special equipment is required. The evaluation of differing designs requires a knowledge of the airspeed, and the optimisation of the design requires a knowledge of the propeller speed in flight. In order to achieve this goal, the UW Aero '97 team is requesting funding for an airborne telemetry system and portable ground station. In addition, the team is requesting funding for two competition engines for test and evaluation purposes.

Benefits of the Proposal:

The telemetry system will allow the current and all future teams to precisely determine the flight regime within which the aircraft is operating. The competition, now in its eleventh year, has become increasingly more sophisticated. Since the last UW team competed three years ago, the nominal lifting capacity of the aircraft has increased 30%. Such advances come at a price of increased sophistication of design, and an increase in the required precision of flight control. Currently, the team encompasses 4 fourth year mechanical engineering students, one second year student, and one first year student. It is the intention of the team to create and environment where information is not lost from one year to the next, but is carried on through involvement from younger team members.

Cost Breakdown of Proposal:

QTY	Description	Unit Cost	Total
1	MIL-STD-300 Telemetry System	$2000.00	$2000.00
2	K&B 0.61 [ci] engines	$ 200.00	$ 400.00
TOTAL			**$2400.00**

Implementation Schedule for Project:

The competition is in early April 1997. As the team has recently completed construction of a 'test mule', the items can be used as soon as funding is arranged.

WEEF Proposal Form

Fall 96

Proposal Title:	SAE Aero Design Competition - Team Pegasus	E-mail:	awang@gaff
Submitted by:	Andrew Wang	Phone Number	725-1543
Position:	Under-graduate student in 4th year mechanical, Part of the SAE Aero Design Team		

Description of Proposal:

The SAE Aero competition is a university level, engineering design competition focusing on the aspects of aeronautics. The competition is sponsored by the Society of Automotive Engineers and many other engineering corporations. The project involves designing and building a model aircraft to lift as much weight as possible. Some of the design constraints include planform area, engine size and cargo space. Waterloo has not sent a team to this competition for a few years but will proudly send two teams for the 1997 competition. As the project is being restarted, some extra funding is necessary to purchase base resources and many of these may be passed to future teams.

Benefits of the Proposal:

Currently, the SAE Aero Pegasus team consists of five members, all in fourth year mechanical engineering who started this endeavor as a 482 project. There are also a few second year students who have expressed interest and have contributed time to the team.

Although Waterloo does not have an Aerospace or Aeronautical engineering program, many students interested in these fields come to U of W. Programs such as the Aero competition develops initiative in students and enhances the education in very practical terms. The actual competition comprises over a hundred schools from all over North America and Waterloo should be represented there, being well renown for it's engineering program. With the proper coordination, this project may grow in popularity attracting students in 1st to 3rd years. Our goal is to establish a team which will continue in existence by other students so the experience and resources may be passed on, similar to some of the other teams. The existence of this legacy will add to the enrichment of education in a field which U of W does not specialize in, but where there is potentially much interest.

Cost Breakdown of Proposal:

Some of the costs under immediate concern are listed below:

Competition Registration Fee:	235.00	($175 US dollars)
2 MAC licenses:	100.00	
Materials for prototype model:	500.00	
	835.00	

The registration for the competition is due on November 20 along with the registration fee. The MAC licenses are so at least two of the team members may be licensed to fly the trainer model and the prototype aircraft. The materials for the prototype include structural materials such as balsa wood, foam, fibre-glass and kevlar strips. Building materials include adhesives, coatings, special tools, and materials to make jigs and molds. Finally, there also off the shelf components such as fuel tanks, wheels, and various specialized hardware for the model.

A partial funding scheme may be:

Competition Registration Fee:	235.00	($175 US dollars)
1 MAC license:	50.00	
One half of the materials budget:	250.00	
	535.00	

Some of the other sources of funding are through the Department of Mechanical Engineering, WEEF (summer 96) and fund-raising events to be held next term. The Departmental funding was used to purchase a trainer model and radio equipment, the WEEF, to purchase the engine, and the fund-raisers will help to support the trip to the competition which is to be held in Daytona this year.

Implementation Schedule for Project:

This project started in the summer and to date a trainer model has been built, research has been done and the preliminary design for the prototype model has been established. This term, most of the team is on a work term so the work will be a little slower. However, one of the members is on campus working with volunteers to learn how to fly model aircraft and to start building the prototype. In January, when the team returns, progress will continue by finishing the prototype, testing it, and building the final plane. At this time, the documentation for the competition will also be completed. The competition will take place in May of 1997.

WEEF PROPOSAL FORM

PROPOSAL: The 1998 Great Northern Concrete Toboggan Team

CONTACT: Carrie Spear email: ccspear@civil 725-7597
Gina Catenazzo email: gcatenaz@civil 746-9303

DESCRIPTION OF PROPOSAL :

The Great Northern Concrete Toboggan Race is an annual design competition involving universities from across Canada, the United States, and Europe. Last years race was composed of approximately 30 teams. The 1998 competition will be held in Western Canada, location to be announced. The objective of the competition is to design and construct a toboggan with a concrete running surface, breaking and safety system, and capacity for five riders. Entries are judged based on technical presentation, sled design and logistics, and overall team spirit.

BENEFITS OF THE PROPOSAL:

The Great Northern Concrete Toboggan Race allows students to apply many of the concepts developed through the civil engineering curriculum. Not only does this competition allow application of principles studied, but it also strengthens the reputation of Waterloo worldwide. The project involves approximately 30 plus fourth year civil students.

COST BREAKDOWN OF PROPOSAL:

The 1998 team is currently in the preliminary planning stages. Presently, we require funding for;

- creating promotional packages to distribute to corporations
  the objective is to solicit the aid of business early and effectively
- initiating fundraising events eg. burger sales
- incidental starting costs eg. communication, research

Request funding in the range of $2000.

IMPLEMENTATION SCHEDULE FOR PROJECT:

We intend to have the promotional packages completed before the end of the Fall 1996 term so that soliciting of the business sector can commence over the work term (Winter 1997).