Process and Instrumentation Technology Expansion

Project Type:	**Education/Skills Development**
Location:	**Del Mar College West Campus**
State:	**Texas**
Municipality	**City of Corpus Christi**
County:	**Nueces**
Grant Amount:	**$1,390,071**
Grant Recipient:	**Del Mar College Foundation, Inc.**

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Project Summary

The Del Mar College Process and Instrumentation Technology programs propose to address the community's growing need for technicians in process, instrumentation, industrial automation, process control, safety and related fields by adding state-of-the-art instructional equipment and faculty/instructors to increase the number of graduates as well as the level and scope of training.

With the influx of heavy industry into the Coastal Bend, the need for trained process and related technicians is growing exponentially. The curriculum in Process and Instrumentation Technology is designed to prepare graduates to work in the petrochemical and other heavy industries. Upon full implementation the project will increase the delivery of credit, continuing education programs, and corporate services. During the 2012 academic year 111 students declared Process Technology as their major and 51 received certificates or degrees. With the proposed expansion of curriculums and addition of the state-of-the-art training units, the College will be able to increase enrollment and awards in Process Technology, Instrumentation and related industrial operations to over 500 annually within five years.

The local demand for college educated and highly trained technicians is immediate and expected to grow over the next decade. The University of Texas Center at San Antonio for Community and Business Research reports a total of 12,982 new jobs in Nueces and San Patricio Counties during 2011-2012 due to expansion of the Eagle Ford Shale oil and gas production. These jobs are projected to continue to grow over the coming years as industry transitions from the production to processing of oil and natural gas. The CCREDC reports that over $18 Billion in direct investment has been announced over the past three years by existing and new employers in the region (see Community Successes report in Attachments Section) and an additional $17 Billion is under development and yet to be publicly announced. These factors indicate strong and sustained growth in the workforce needs related to process, instrumentation, industrial automation, process controls, and related fields supporting the need for additional capacity to education and train our workforce.

Polaris Engineering Glycol Distillation Unit and Ancillary Equipment #657

The College is seeking assistance to purchase a state-of-art Process Technology Base Unit and Glycol Distillation Unit with ancillary equipment/software and a Process Control Learning System to respond to the growing demand. The equipment needs total **$1,390,071** with set-up achievable within one year. These systems are recognized as the best in the industry and meet the diverse needs of the developing workforce.

Local Needs of the Workforce

Today, leaders in the petrochemical industry require that process operators and technicians have an Associate Degree in Process Technology or related industry certifications. According to the TEX-SIS Newsletter for industry, the average annual statewide salary for graduates entering this type of employment is $37,440, and the placement rate is 96%. Per the Corpus Christi Regional Economic Development Council's August 2013 Trends, manufacturing jobs in the Coastal Bend were paying $73,464, which is on par with the state-wide rate of $73,836. Economic Modeling Specialists, Int., (EMSI) reports that the classification of jobs for Support Activities for Oil and Gas Operations will grow 39% between 2012 and 2017 (from 624 to 827). Indications from regional economists, however, report this number is very conservative and will be far exceeded.

Long-Term Outcomes

Del Mar College's mission is to provide access to quality education, workforce preparation, and lifelong learning for students and community success. As a nationally recognized, locally focused community college, Del Mar College serves a diverse population of adult learners, dual credit students, continuing education students, and high school graduates seeking to grow in knowledge, skills and career opportunities. Ninety percent of our students come from and remain in our community, making Del Mar College a primary economic catalyst for the region as we increase the educational level and workforce skills available to support the expanding needs of local business and industry.

Designers Assistance Corp/Polaris Enhanced Instrumentation Unit #656

The long term objective of the project is to prepare our local workforce for jobs in the high tech industries moving into the Coastal Bend. Specifically, this program will enhance access and delivery of programs in Process Technology to include Instrumentation, Engineering Technology/ Industrial Automation, Safety and related skills. Presently these programs exist as degree and certificate options for students seeking college credit. This expansion will add continuing education programs and certificates allowing non-traditional, continuing education students, and existing employees to participate. Partnerships will also be developed with area independent school districts to provide entry level courses that articulate into college level programs.

In order to achieve these goals, readily accessible equipment on which to learn is necessary. Process and Instrumentation Technology are not merely theoretical programs of instruction; they are highly interactive requiring students to have hands-on/eyes-on knowledge of the fundamentals common to all industries. Presently the delivery of these programs is limited by the

need for additional equipment and increased capacity within the facility. Project expansion includes the performance-based curriculum to deliver advanced and basic skills through demonstrations, use of computer simulations, and replicated models. Training simulators and models provide the safe environment in which to hone these skills.

Support of the Local Industrial and Petrochemical Advisory Leaders:

The Process Technology program is guided by an Advisory Committee comprised of representatives of local petrochemical and industrial leaders. Members of this advisory committee recommend the resources and curriculum needed to prepare a highly skilled workforce. The types of equipment and learning models presented in this proposal are utilized at many other community colleges and endorsed by the industry leaders. The 2013 Advisory Committee members are:

Name	Title	Company
Johnny Arevalos	Training Superintendent	Valero-Corpus Christi Refinery
Robert Walls	Unit Manager	Sherwin Alumina Company
Robert W. Perry	Training Department	Dupont – Corpus Christi Plant
Susan A. Temple	Human Resources Manager	Dupont – Corpus Christi Plant
Barbara Griffin	Training Manager	Citgo – Corpus Christi Refinery
Pat Silvas	Operations Training Leader	Flint Hills Resources – CC Refinery
Marie Kocurek-Montgomery	Training Department	Valero – Corpus Christi Refinery
Vivakanand Subnaik	Technical Training Leader	Flint Hills Resources – CC Refinery

Meeting Future Employment Requirements – Project Need

New and existing companies have shared their anticipated employment requirements. Projections are provided below. The total anticipated employment needs within these industries is between 2,210 and 6,910 permanent jobs.

Company	Project	Projected Permanent Jobs
Cheniere Energy	Eagle Ford Shale LNG Plant	160
Kiewit Offshore Services	Gulf of Mexico Oil/Gas Production Platforms	1,000 – 5,000
La Quinta – The Port of Corpus Christi	Multi-Purpose Import/ Export Facility	150 -200
TPCO America	Tianjin Pipe Production	100 – 600
M&G Group	PET & PTA Resin Production	250
Trafigura Terminals LLC	Inner-Harbor Export Shipping Terminal – Added Dock & Pipeline	200
Flint Hills Resources	Energy Refinery Expansion	50 - 150
Occidental Petroleum – Naval Station Ingleside	LNG/LPG Plant	150 – 200
Voestapline – DRI Plant	Steel/Iron Production	150

Present Student Enrollment, Graduation and Projection of Growth

DMC Current Process Technology Program:

The curriculum in Process Technology is designed to prepare graduates to work as process operators in the petrochemical industry. The curriculum provides general education in mathematics, applied physical science, English, basic computer principles and operation; process operating procedures; fundamentals of process instrumentation, statistical quality control, process equipment, reactions, reactors, distillation process, safety, problem solving and troubleshooting. Presently the delivery of this program is limited by the need for additional equipment and increased capacity within the facility. Project expansion includes the performance-based curriculum that delivers advanced and basic skills through demonstrations, use of computer simulations, and replicated models.

This past year the College has worked with local industry leaders, the Education Service Center, and area school districts to develop the entry level process technology course for high schools. This course will be taught in the Spring of 2014 and in future semesters.

Process/Instrumentation Technology:

During the 2011-2012 academic year, 111 students declared Process Technology as their major. Total enrollment in was 236 students with 10 students graduating with the AAS and 41 receiving certificates. A total of 105 awards were earned over the past two academic years. The need for a workforce prepared to address this expanding industry is evident, yet current enrollment opportunities are limited due to the need for additional resources, both equipment and instructional capacity.

Del Mar College is developing multiple educational strategies to address this need for a qualified and skilled workforce pool for industry by creating integrated curriculum designed for delivery through continuing education, corporate services, introductory credit classes in area high schools, as well as the current college credit opportunities. The continuing education and corporate services curriculum will allow the College to address emerging and changing needs of industry workforce training. These curriculums can be quickly modified to be responsive to specific business and industry needs including safety training and focused skills training applications. The high school credit options will be the further development of duel credit offerings through area independent school districts to provide basic skills and introductory classes to reach an expanded population of emerging technical workforce.

No college within South Texas has a training facility geared toward industry as outlined in this proposal, yet this state-of-the-art technology is the industry standard. Other successful college programs in Texas serving the petrochemical and related industries are located primarily in Houston. The integrated program and expansion of resources made possible by this grant can result in an exponential growth of highly trained technicians. Below is the projected growth in

degrees and awards over the next five years, projections which are validated by the Houston area higher education institutions:

Year	Stage	Percent Increase	Total Awards for the Year
0 to 1	Purchase & Installation	25%	64
1 to 2	Implementation	200%	128
2 to 3	Integration	200%	255
3 to 4	Integration	150%	383
4 to 5	Integration	125%	479
5 to 6	Integration	125%	600

DMC Strategies to Reach Increased Numbers of Students

Purchasing this state-of-the-art technology will allow the College to increase enrollment capacity and expand delivery of training. To meet the increased demand, the College will hire an additional full-time tenure track faculty member credentialed in the field and three full-time continuing education instructors. This commitment from the College will incur over $300,000 per year in salaries and benefits to be phased in as enrollment increases. Additional part-time instructors will be hired at rates comparable to the market to meet corporate training needs.

In addition to the existing college credit associates degree and certificate, the College is introducing corporate and continuing education certificates to provide added flexibility of transfer and access for the existing workforce. These certificates are attached for your reference.

The College will implement the following strategies to increase delivery and integration:

1. Provide state-of-the-art equipment, software and resources ensuring the technology relates to the same high quality found in the work-place and expected by employers.
2. Expand services to area independent school districts to develop integrated curriculums that lead into College programs.
3. Hire additional qualified faculty, instructors and corporate trainers to increase delivery and flexibility of course offerings.
4. Review and revise program curriculums to provide multi-level, competency-based entry and exit for students and employees.
5. Develop aligned curriculums in continuing education and corporate services to expand availability of courses and programs.
6. Promote and market programs locally and throughout the nation to attract the workforce needed for continued economic growth for the community.
7. Partner with area school districts, industry leaders, and entities such as Worksource of the Coastal Bend to recruit students and link them with potential employers.

Project Budget Explanation:

The full project budget is outlined below:

Total Project Budget		
Item	**Total**	**Notes**
Process Technology Base Unit	$ 339,800	Designers Assistance Corp/Polaris Engineering Hands-On Skid Mounted Pilot Plan – Enhanced Instrumentation #656 Includes 21 Additional I/0 points with Rosemont Fisher and Ohmart Vega Instruments, Emerson Delta V Distributed Control (DSC) System
Process Technology Full Capacity Unit	$ 625,000	Glycol Distillation Unit and Ancillary Equipment by Polaris Engineering #657 Hands-On Operations Training Skid Unit. Working fractionation tower designed to support process technology. Fabricated to ASME standards, incorporates durable state-of-the-art industrial control components. An add-on or separate to the #656 unit. (11ft. L x 24 ft. W x 32.5 ft. H)
Simtronics Software	$ 42,050	Process Technology Software Upgrade
Process Equipment Additions	$ 95,094	Designers Assistance Corporation – Safety Relief Valve, Heat Exchanger, Bulk Storage, Pump Impeller Sample Board and multiple assemblies.
Facility - Concrete Pad and Fencing	$ 125,000	18'x30' concrete pad with security fence, electricity and roof
Amatrol Learning Systems – Level/Flow Process Control; Temperature Process Control; Pressure Process Control Hardware; PLC Learning Systems	$ 163,757	Operates as a stand-alone training system. Includes table-top workstation , control panel, liquid tanks, centrifugal pump/motor, piping network with valves, instrumentation, PLC interface, BB720 Student Learning Activity Set, Installation Guide
TOTAL	$1,390,071	Process Technology and Instrumentation Technology Expansion (complete listings of all components and specifications are attached)

Amatrol Process Control Learning Systems

Del Mar College Existing Commitment to the Process and Instrumentation Technology

The present operating budget for the Process Technology program is $150,000 in direct salaries, plus indirect expenses of administration and clerical support. Currently the program provides Simtronics computerized simulation software of the processes with a petrochemical plant, computer lab for students and a model for students to review valued at over $80,000. These resources provide limited access and reduced capacity to expand the program. However, recent investment by the College in the Engineering Technology/Industrial Automation, and Instrumentation Control provides the addition of a robotics automation line for an additional $280,000. Overall equipment is valued at over $550,000 plus annual operating costs of $150,000.

Presently all classes are taught on the Del Mar College West Campus. The equipment purchased with this grant would be located on the West Campus on a new concrete slab and fenced facility directly behind the Flato Technology Building. This will become the primary location for the Process and Instrumentation Technology programs, providing state-of-the-art facilities with classroom labs for the software and supporting technical units.

With funding of the equipment component of this project expansion, the College will hire additional instructional staff and provide related supplies to support the programs for an additional $300,000 to be phased in as enrollment increases. The College will also provide funding to upgrade the power lines going to the simulator with an estimated cost of up to $50,000.

Type A Funding Request. Del Mar College through the Del Mar College Foundation, Inc. requests education/skills development funds from the Type A fund in the amount of **$1,390,071** to acquire the necessary equipment to expand the DMC Process and Instrumentation Technology programs. With Type A support, Del Mar College can implement the project in one phase and be fully operational by the beginning of the fall 2014 semester.

Near Term Outcomes

The near term objectives of the project include construction of the concrete pad and fencing, purchasing and delivery of the base unit and full capacity units, upgrading the electrical and water lines running to the simulator as needed, installation of software and additional equipment add-ons, and integration into classroom instruction. Delivery of the units can be expected within three months to four months of issuance of the grant award and contract. Expanded class offerings can be expected to commence within 60 days of the delivery and setup of the equipment pending any unforeseen conditions.

With implementation of the expansion project, employers in the region would be served in the following ways:

1. Existing and new industrial organizations will be able to hire highly skilled entry-level workers and train existing employees in advanced skills in the related job classifications.
2. Potential workers migrating into the region due to economic growth will be able to re-train and develop the skills needed for the existing and emerging workforce.
3. Affordable and accessible education and training will be available to develop the workforce that is needed to meet present and future demands.
4. The programs, resources and instructors will be aligned with the community partners to collaborate as continued growth develops.

Conclusion

Del Mar College is grateful for past support provided by Type A funds. Investment in 2009 assisted the College in establishing the Northwest Center. Today that center is serving more than 250 students in healthcare, software applications, GED, and core English programs. These programs are expanding to include natural sciences in the spring 2014. During summer 2012, the expansion of the Del Mar's Aviation Maintenance Training program located at the Corpus Christi International Airport began providing classes in the facility made possible by Type A funds. The Transportation Training Program Simulators purchased by Type A funds in 2013 have provided numerous new over-the-road drivers to local industry. We believe these programs are excellent examples of positive investment by the Board, providing jobs and economic growth for our community.

The participation by the Type A program is critical to the expansion of Del Mar College's Process and Instrumentation Technology programs at this time. We believe a **$1,390,071** grant from the Type A program would enable Del Mar College to ramp up its process training program to serve the growing and urgent need for industrial operators.